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Cost and Technical Men Meet at Kalamazoo

Interstate Meeting Sponsored by Kalamazoo Division of the Cost Association of the Paper Industry and Paper Technologists Club Is Attended by Representative Cost and Technical Men from Nine States—Enthusiasm Aroused for Fall Cost and Technical Conventions at Washington and Richmond

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., May 21, 1929.—The Cost Association of the Paper Industry, Kalamazoo Valley division, and the Paper Technologists Club of Kalamazoo were jointly hosts Friday and Saturday of last week to an Interstate meeting of mill cost and technical men. It proved to be one of the most interesting and enthusiastic sectional gatherings ever held in this city and brought out over 100 from nine states of the Union.

Meetings at Park-American Hotel

There were dinners, luncheons, sectional meetings, all held at the Park-American hotel, while as diversions visits to the Kalamazoo paper mills and opportunities to play golf were in order. Harry C. Bradford, secretary of the Rex Paper Company, was the chairman of the committee in charge of arrangements. His coworkers were: C. B. Barton, Jr., Michigan Paper Company; N. J. Cowie, Hawthorne Paper Company; E. F. Whittington, Sutherland Paper Company; E. J. Turner, Paper Makers Chemican Corporation and A. C. Dreshfield, also of the Paper Makers Chemical Corporation.

The first general session was a luncheon, held Friday noon. Harry C. Bradford presided and Mayor E. M. Kennedy extended the privileges of the city to the visitors. Norman J. Cowie and C. B. Barton, Jr., respectively president of the Cost Association and Technologists Club, responded.

Two Sectional Meetings Friday

Two sectional meetings were held. The cost accountants listened to papers by State Representative James M. Wilson and Thomas J. Burke, New York, secretary-treasurer of the Cost Association of the Paper Industry. The former spoke on "Insurance." His paper dealt with the Michigan laws governing that subject. Mr. Burke had a paper on "Time as a Cost Factor in the Paper Industry." George K. Ferguson, secretary of the Watervleit Paper Company, presided.

E. F. Whittington, of the Sutherland Paper Company, was in the chair at the technical sectional meeting. Three subjects were introduced: O. P. Gephart, of the Oxford Miami Company considered "Pulp Evaluation and Its Adaptability to Paper Making." Dr. Th. C. Bentzen, of the Whiting Plover Paper Company, gave a paper on "Detection of Starch, Gum, Glue and Casein in Paper." Paul Hodgdon, of the Munising Paper Company, gave a paper on "Beating."

Banquet Friday Evening

Friday evening there was an informal banquet with N. J. Cowie presiding. E. J. Turner, of the Paper Makers Chemical Corporation acted as toastmaster. R. B. Wolf, announced as the speaker, failed to appear and Prof. C. T. Goodsell, professor of history at Kalamazoo College, substituted for him with an address on "The Romance of Tippecanoe." That stirring event in American annals was interestingly handled and well developed. He told of the importance of Gen. William H. Harrison's campaign against the Indians and the effect it had in opening up the then west for settlers.

Mill Visits

Saturday morning was devoted to mill visits and golf, the guests returning to the Park-American hotel for luncheon at noon. Ivar Lundbeck, formerly with the Lee Paper Company, Vicksburg, now with the Thilmany Pulp and Paper Company, Kaukauna, Wis., gave a paper on "Recent Observations on Scandinavian Pulp and Paper Manufacture." It is a topic he has studied carefully and kept closely in touch with. A. C. Dreshfield of the Paper Makers Chemical Corporation, presided.

Sectional Conferences

Two more sectional conferences were held Saturday afternoon. Frank Brown of the Michigan Paper Company presided at the cost accountants meeting. H. E. Parkman, of F. C. Huyck and Company, Albany, gave a paper on "Standard Costs." Herbert S. Davy, of the Postum Cereal Company, B ttle Creek, had as his topic the "Rejuvenation of Cost Figuring by Means of Time Study Data." F. D. Libbey, of the Kalamazoo Vegetable Parchment Company, was in the chair at the section of technicians. Two papers were read. One by K. P. Goehegan, of the Aetna Paper Company of Dayton, Ohio, on "Notes on Analytical Paper Microscopy," the other by N. L. Nourse, of the Brown Company, Berlin, N. H., on "Alpha Pulp." Both sessions ended with the opening of question boxes.

Dinner Saturday Evening

A dinner Saturday evening closed the conference. The speaker of the evening was Rev. John Wirt Dunning, D.D., pastor of the First Presbyterian church of this city. There was also music and entertainment. C. B. Barton, Jr., of the Michigan Paper Company and president of the Paper Technologists Club, presided. Elbert G. Milham, of the Bryant Paper Company acted as toastmaster.

One of the features of the meeting here was to arouse interest in the national meetings of the two organizations, which will be held at Richmond, Va., and Washington, D. C. It is expected Michigan mills will send a fine delegation to those gatherings.

The Registered Guests

The registered guests were:

Kalamazoo—A. E. Woolam, Hill Clutch and Machine Foundry; Harold Heath, Rex Paper Company; Harry C. Bradford, Rex Paper Company; Elbert Milham, Bryant Paper Company; Howard Scott, Robert S. Mickey, Thomas W. Peck, Ralph Hayward, F. D. Libbey, Alfred B. Perlick, John C. Wood, all of Kalamazoo Vegetable Parchment Company; L. A. O'Toole, James Foxgrover, H. R. Miller, C. E. Mueller, Harold F. Stoll, A. C. Dreshfield,

(*Continued on page 42*)

Pennsylvania Paper Mills Are Less Active

While Some Book Paper, Board, Roofing and Felt Manufacturers Are Well Booked Ahead, Other Plants Are Not Operating on Normal Seasonal Schedule—Fine Paper Market Rules Spotty, With Purchasers Confining Attention to Immediate Requirements

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 20, 1929.—A few paper manufacturers are enjoying a broader operation schedule but demand is not generalized among producers in this section. A few book paper mills, board manufacturers, roofing and felt manufacturers, and other building paper makers, are booked with a good volume of business but others are not operating at normal seasonal scale. Kraft manufacturers are not sold ahead to any great extent owing to the tendency of the distributors to mark time pending a clearer outlook for the future.

Fine paper dealers are confined to a narrow spotty market with buyers confining their requirements to the needs of the day. Mill representatives and those merchants who cater to the larger consumers in the printing and publishing field report a satisfactory demand with volume centered in the uncoated book grades or direct mail supplies in coated specialties, colored papers that harmonize with covers also used in direct mail announcements and advertising.

Seasonal requirements of wrapping paper are more active. Krafts are not moving with alacrity, but hold firmer than a year ago, when mills started campaigning for tonnage business. Bags are not moving freely but are steady in values. Tissues hold firm but move slowly.

Dearth of mill orders keeps the wholesalers of paper stock in a waiting attitude. Small supplies are on hand of the better grades of books, ledgers and shavings. Cheaper grades of paper stock are being sold in less volume, as board manufacturers buy their own requirements directly through representatives of certain houses under long term contract. Similar long term contracts were made for the scarcer grades of book paper where set prices are made to secure all available supplies collected by specified firms. Rags in the cheaper grades are in demand among roofing manufacturers but the list as a whole is not active.

S. Walter Inc. Issues Additional Stock Allotment

Following two years of successful operation of its business under the extended employee ownership program, S. Walter Inc., last week passed along to its workers an additional stock allotment of substantial proportions in recognition of the conscientious labors of the staff members in behalf of the business. With the issuance of the additional stock allotment new representatives from the workers were enrolled in the common stock holdings of the firm. The plan of permitting the broader representation of the employees in the stock ownership of the company was inaugurated two years ago when the capital of the company was increased by issuance of two shares of common for every share of preferred stock outstanding. One half of these shares were kept in the treasury and the other half apportioned to preferred stock holders, who received one share of common. The balance in the treasury is to be sold from time to time. President Simon Walter, head of the company, relinquished his rights to subscribe to any of these shares, but apportioned them to other stock holders and employees not stock holders according to their standing merits in the welfare of the business. This meritorious system of rewarding worthy employees has been a profitable venture for the company, as the present stock allotment has doubled in value as the business of the past year increased proportionately. The price of the treasury common stock is determined by the surplus which is left in accumulations after the dividends of 8 per cent on the preferred stocks are paid.

Under the stock allotment which has just been made there are sixteen employee stock holders in the Philadelphia headquarters and the York, Pa., branch of the company. Two stock allotments have been made within the same number of years that the elaborated co-operative plan of the reorganized capitalization has been effective. There is contemplated another stock allotment from the treasury stock before the present year has waned—for both present holders and for outside acquisitions which the firm is anticipating. The company is also adding to its lines and looking forward to increased territorial distribution of its papers and products, as well as the sales organization.

Joint Meeting Of Paper Association

With 100 per cent attendance, the special meeting of the fine and wrapping paper divisions of the Philadelphia Paper Trade Association was held last week in the Bourse Restaurant, for the purpose of taking up matters of national importance pertaining to the paper industry. With every house represented at the session President Simon Walter took up the questions for which the special session was called under his direction. These problems were those identified with the National Paper Trade Association work and pertained to innovations in trade customs to be recommended to the Federal Trade Commission by the national organization. The source of information on which the trade customs were discussed was a booklet sent out by the association and distributed to each member. A special committee of the local members was appointed to study the booklet and formulate a reply. The members of the Philadelphia association who were appointed to this committee are President Walter, Vice President W. S. Wilcox, T. H. B. Smythe and Leon Beck.

Following the meeting it was announced that an outing had been arranged for June 11. This outing will be in the way of a trip on the Delaware River for an educational inspection of the Port of Philadelphia. The paper trade associates will be the guests of the City of Philadelphia and will make the tour in a specially chartered boat. Members of the New York and Baltimore associations have been invited to join in this interesting tour of the Port. There will be refreshments and entertainment for the guests.

Retail Waste Merchants Adopt Charter

Following a discussion of the charter which has been drawn up by the attorney of the newly organized Retail Waste Merchants Association, at the hall in the building 916 North Franklin street, last Thursday, it was decided by the members that the papers of incorporation be presented to the Governor of the State of Pennsylvania preliminary to the permanent organizing of the retailers of waste products, including paper stock and rags. There were 52 firms represented at the meeting, who heard the attorney for the organization, W. B. Ginsberg, review the charter he had drawn, and who unanimously accepted it unchanged from the original document, by their affixed signatures. Mr. Ginsberg, whose law offices are in the North American Building, was appointed general attorney for the members and for the organization. He will give his services to the members in all matters pertaining to trade activities and will take up their difficulties in court action where any infringement of the recent ordinance of Council is involved.

There recently was passed a City Ordinance which prohibits collectors of waste from littering the streets and after several arrests and fines, retailers were involved in the toils of the law through ignorance of its regulations. It is for the purpose of aiding these offenders that Counsel has been provided by the organization. It was announced at the meteing that the following

had been elected officers pending the issuance of the charter: William A. Coll, William A. Coll Company, president; H. F. Wilson, H. F. & H. P. Wilson Company, 1st vice president; S. Halpern, M. Halpern & Son, 2nd vice president; Henry Rosenbaum, secretary, and L. Bornstein of L. Bornstein & Son, treasurer.

Thomas W. Price Co. Enlarges

Having acquired the adjoining corner property, formerly occupied by Curtis & Bros. as their Philadelphia sales offices, the Thomas W. Price Company, 503-505 Ludlow street, have extended warehouses and executive offices. The firm is occupying the Curtis quarters, recently vacated when those mills retired from the distributive field and confined business to the manufacture of paper in the Newark, Del., mills of the company. The new location gives to the Thomas W. Price Company the entire lower floor and basement for the housing of executive and sales offices and additional warehousing space.

In the main floor offices removed are the offices of Norman R. Fort, son of the head of the firm, Thomas R. Fort, Sr., and those occupied by Theodore Johnson, long associated with the business. The sales staff and sample rooms also are located here. In the new addition several display windows are available on Ludlow street and on Fifth street, in which the various lines handled in fine papers and envelopes are exhibited. Though the sales and executive offices have been removed to the corner building the head of the firm, Thomas R. Fort, will retain his offices in the old structure which for many years has been the firm's headquarters and which will be in the future mainly devoted to warehousing purposes.

Outing For J. L. N. Smythe Co.

The annual outing of the J. L. N. Smythe Company, 30 South Sixth street, will be held on June 8 at Chestnut Hill when there will be staged a sports program and outdoor events with luncheon and dinner. The members of the staff will be the guests of the firm, with Harvey E. Platt and T. H. B. Smythe, of the company, extending hospitality. The group of employees and officers will journey to the outing in autos arriving in time for a picnic luncheon and then joining in the various games and sports events staged for the afternoon. There will be a baseball contest between the married and single men with many novelty and fun provoking stunts to while away the hours in the wide open spaces.

T. H. B. Smythe On Kraft Committee

T. H. B. Smythe, of the J. L. N. Smythe Company, has been appointed a member of the Kraft Committee of the National Paper Trade Association. He journeyed to the meeting of that committee held in Chicago several days ago, returning to his desk this week. He is a member of the Smythe company, founded by his father and the late J. L. Neville Smythe, who was organizer of one of the largest wrapping paper concerns in the East and which during the war days conducted several branches in South America and in Australia. He is a former vice president of the Philadelphia Paper Trade Association and has represented it at the annual convention as delegate from the Wrapping Paper Division.

The Smythe Company has developed a very extensive business in this territory for the Gator Hide Mulch Papers made by the International Paper Company, for which products it is sole local distributor. It has been distributed in large quantities among the agriculturists of the South Jersey territory and in Eastern Pennsylvania where hardware and seed houses catering to this class of trade have stocked freely with this latest aid to the farmer.

Norbert A. Considine Nominated

President Norbert A. Considine, of the Paper House of Pennsylvania, has been nominated to the Board of Directors of the Poor Richard Club of this city, the fraternal organization of the advertising profession. His election will take place at the annual meeting to be held on May 30.

Paper Men At Canadian Box Convention

Members of the Philadelphia paper trade attending the international paper box convention held in Toronto from May 15 to 17 were John A. Datz, of A. S. Datz & Son; Charles Matthias, of the Matthias & Freeman Paper Company; G. Rudolph, of the Charles Beck Paper Company; Charles Beck, of the Beck Machine Company; John Frantz, of A. Hartung, Inc.; W. A. Welsh, of the Paper Service Company; and Philip Rudolph, head of the firm bearing his name.

International Sued by Daily News

An agreement by the International Paper and Power Company to advance $5,000,000 to the News Syndicate Company, Inc., publisher of the *Daily News,* as a building loan on its skyscraper now being erected in East 42nd street, and reasons why the contract was not carried out, were set forth in pleadings filed in the Supreme Court last week in a suit by the *Daily News* against the International.

The newspaper asserts that as a result of its demands for the return of overpayments made for Rangely print paper in 1928, in excess of the rates charged other customers, it was agreed between the parties last October 19 that a settlement would be made with the plaintiff on the basis of $1,500,000, and that as part of the settlement $300,000 in cash would be paid on January 1 last, and $600,000 more would be paid in three yearly installments.

Another clause of the agreement provided that the newspaper would get a contract to purchase paper at an average of $65 a ton, or as much less as the lowest terms on which the International's competitors sold to other customers in the New York and Chicago metropolitan districts.

After this agreement had been signed for the *Daily News* by its secretary, Roy C. Hollis, and for the International by A. R. Graustein, president, a supplemental agreement, also signed by them, was added. This provided for a $5,000,000 mortgage at 5 per cent covering ten to twenty years, with payments of at least $250,000 a year, and a further clause reciting that the International would lease ten floors, from the 24th to the 33rd story, at $2.64 a square foot, for five years beginning May 1, 1930.

The answer of the International asserts that this agreement was canceled because the *Daily News* declined to permit the International to extend to other customers "equivalent concessions" for the purchase of paper to 1934. Therefore, it is said, the *Daily News* refused to sign the contract tendered by the International carrying out the loan and lease clauses, and the present suit has been brought as a result.

Hammermill Paper Co. Changes

Several advancements in the executive personnel of the Hammermill Paper Company were made at a meeting of the board of dirctors, held on May 14. Norman W. Wilson, vice-president of the Hammermill organization since 1914, was made first vice-president and general manager.

The three new vice-presidents who were created are W. F. Bromley, secretary of the company, who now becomes vice-president and secretary; W. T. Brust, assistant treasurer, who now becomes vice-president and assistant treasurer; and C. W. Chabot, director of distribution, supervising sales and advertising activities, who now becomes vice-president in charge of distribution. Mr. Chabot was also elected to the Hammermill executive committee which was increased from five to six members.

Ernst R. Behrend and Dr. Otto F. Behrend, founders of the Hammermill Paper Company, continue as president and treasurer, respectively.

Swedish News Print Output Expands

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 22, 1929.—News print production by the Swedish mills during the first three months of this year totaled 60,832 metric tons, an increase of 10,336 tons or 21 per cent over the corresponding quarter in 1927 and 27,900 tons over the output during the first three months of last year, when the mills were involved in the labor difficulties.

Bay of Fundy Hydro-Electric Project Hits Snag

Canadian and United States Governments Withhold Consent to Development of Passamaquoddy Bay, Due to Protests of Fishing Industry—Dexter P. Cooper, Head of Syndicate Promoting Scheme, Is Optimistic of Success in Overcoming Opposition

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 20, 1929.—Ever since water powers began to loom on the horizon as potential sources of electric energy it has been the dream of engineers to harness the tides in places where these are of exceptional height and power. Many difficult problems have been met with in preparing plans for developing power from the tides, and now when at last the engineers claim that they have solved the technical as well as the financial problems, another and still more perplexing problem has sprung up, namely the humble sardine.

One of the choicest sites in the world for development of tidal power is to be found in the Bay of Fundy, bounded by the shores of Maine, New Brunswick, and Nova Scotia. The full force of the Atlantic tides, rushing into this narrow bay, causes at places a difference between high and low water of over 50 feet. Engineers dream of the time when this mighty and constant power will be harnessed, to transform the Atlantic coast in this district into one of the greatest manufacturing regions in the world.

Headed by Dexter P. Cooper, a syndicate is ready to start the work of development at Passamaquoddy Bay, but they have to get the consent of the American and Canadian governments, and that consent has been held up because certain interests claim that the works would destroy the sardine fishing industry. Now the sardine may be important in its way, but compared with the potential fruits of tidal power development it is like a fly on a wheel. But that fly for the present has been able to stop the wheel from revolving, and stay the hands of the engineers.

Possibly it will not always be so. At any rate, Mr. Cooper is optimistic of success, and is hammering away at his project. So far, at any rate, the scheme has not been definitely turned down.

Meanwhile Mr. Cooper is interested in another proposed tidal power development, this one being on the Petitcodiac River in New Brunswick, also a tidal water Bay of Fundy proposition, but situated in the south-eastern part of the Province.

Recently Mr. Cooper was at Moncton and in conference with directors of the Petitcodiac Tidal Power Development Company, at which the project was discussed in detail.

Mr. Cooper suggested that the proposition appears to have such merit as would warrant the securing of some $50,000 which would be expended on a thorough investigation as to the possibilities of the proposed hydro-electric development and should these findings warrant it, to proceed with the work. It is expected that some of the engineers who have been engaged on the Cooper tidal development proposition at Passamaquoddy Bay will shortly be looking into the Petitcodiac project.

If predictions should be lived up to, the Petitcodiac development would be a tremendous new development of hydro-electric energy in southern New Brunswick. It has been under advisement for some years and surveys have been made by Federal engineers.

New Industrial Use for Straw

A preliminary plant has been set up just outside Regina, Saskatchewan, for the manufacture of waste straw into a building material that competes very favorably with lumber and is capable of being worked in exactly the same way, with the added advantages that it is almost fireproof, and sound proof and has greater insulating qualities.

Panels of straw board are made by special machinery designed and built by a French engineer. A unit of this machinery has been installed on the T. A. McCusker farm, slightly north of Regina on the Albert street highway, where it has already been satisfactorily demonstrated.

Canadian rights for the manufacture of this product have been acquired by a Regina citizen who proposes to organize a company for the extensive exploitation of waste straw in the western provinces. A company manufacturing straw-board has been in operation in France and Belgium for the past seven years. It is used there for the building of houses and for finishing purposes in larger buildings such as hotels and apartments.

The process of manufacture involves the subjection of the straw to pressure of 100 pounds to the square inch. The straw is taken as it comes from the stack and fed into the machine where it is pressed into shape. Then it is laced with wire and comes out as a long board some five feet wide and 14 feet long ready for immediate use.

Steel hooks reach out of the machine to draw the straw into the compressor through a slot-like opening piston, exerting enormous pressure, deliver sledge hammer blows on the straw and compress it so tightly that the final panel is as rigid as wood.

So tightly packed is the straw that it withstands the flame of a blowtorch without breaking into flames. This test results, according to witnesses, only in the charring of a small area and if persisted in, a small hole is charred right through the panel. But so small are the air spaces in the material that oxidation proceeds relatively slowly and the material does not burst into flame.

The straw-board may be used as it comes from the machine, or it may also be coated with plaster. It is suitable both for inside and outside purposes.

Straw from one quarter section of land would keep the present small unit at Regina in operation for about a year, the manufacturers claim.

Overseas News Print Markets

Canadian news print manufacturers are steadily developing oversees markets for their product, as is shown from the following table of exports for the first quarter of 1929, with comparative figures for 1928:

	Three Months	
	1929	1928
United Kingdom	34,586	8,465
Cuba	2,296	2,584
Jamaica	271	228
Argentina	10,164	14,167
Other Latin America	3,113	249
South Africa	4,728	3,655
Australia	16,728	12,684
New Zealand	5,742	4,324
All Other	438	211
Total	77,983	46,567
United States	535,700	510,473
Grand Total (tons)	613,683	557,040

In 1928 overseas shipments of news print increased by over 100 per cent as compared with 1927, namely from 133,395 tons to 271,698 tons.

Workmen's Compensation Tangle

A tangle has been created in connection with the new workmen's compensation law in Quebec Province. This law is administered

by a Workmen's Compensation Commission, and it was intended that this Commission's judgment should be final.

Now, however, Justice Surveyor, of the Superior Court, has refused to approve of certain awards of the Commission without inquiring into the validity of the cases. This followed upon the action of insurance companies who objected to some of the findings and took them into court. The present judgment by Justice Surveyor therefore throws the whole question of jurisdiction into the melting pot, through the Justice's refusal to homologate or ratify the awards of the commission without regard to the merits of the case.

Price Bros.' New Machines

The two new machines which Price Bros. & Co. have installed in their Riverbend plant are now reported to be in operation, bringing the capacity of the plant up to 400 tons of news print per day, and the total capacity of the Price plants up to 925 tons per day.

Stebbins Company Expands

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., May 21, 1929.—The Stebbins Engineering and Manufacturing Co. of this city has just completed the reprocesses used principally in chemical pulp mills.

On May 1, T. L. Dunbar of Montreal, formerly of Watertown, resigned as active manager of the Stebbins Company's Montreal office to take over the presidency of Chemipulp Process, Inc. which has been a subsidiary of the Stebbins group. Mr. Dunbar will represent Chemipulp in Canada.

On June 1, A. D. Merrill of Watertown will resign as an active member of the Stebbins Company's Watertown office to become associated with the Chemipulp business in the United States. Mr. Merrill will establish separate offices in this city to carry on the executive and engineering work involved in the Chemipulp processes.

Both these gentlemen have been associated with the Stebbins' interests for several years and although they will continue as stockholders of this group, they will necessarily devote their full time to the Chemipulp division. The lines of both companies are closely related and both will function cooperatively.

A. F. Richter, president and treasurer of Stebbins Engineering Company, and vice president of Chemipulp Process will continue to direct the affairs of the Stebbins organizations in the United States and Canada. He will be assisted in Montreal by E. F. Tucker who has had several years of valuable experience with the Stebbins firm in both United States and Canada.

In the Watertown office, Mr. Richter will be assisted by his son Carl Richter of Portland, Maine, formerly of Watertown, who has been associated for the past few years with Paper Makers Chemical Corporation as sales and service engineer. Carl Richter has had several years of experience with the Stebbins firm previous to this time.

Both E. F. Tucker and Carl Richter are graduates of Clarkson College in the Chemical Engineering course, and both are fully equipped to carry on the executive and engineering details of this specialized business of acid proof linings and chemical pulp processes.

L. W. Dimmock will continue as manager of the Stebbins Pacific Coast office. This western office was established in Tacoma, Wash. two years ago.

Novelty Bag Co. Organized

VANCOUVER, Wash., May 17, 1929.—The Novelty Bag Company is being organized for operations here, according to tentative announcement made early in May. Machinery will be contracted for as soon as organization is completed. It is reported that capitalization will be $100,000, with from 50 to 150 to be given employment. A suit-case shaped paper shopping bag will be the product manufactured. Those interested in the promotion of this company are Dave Crockett, G. L. Oman, Fred Porter, Thomas Earls and J. D. Budd.

The Advertiser and the Woodpile

[FROM OUR REGULAR CORRESPONDENT]

HIBBING, Minn., May 24, 1929.—"A woodpile a mile square and fifteen feet high will be used by the newspaper advertisers in the United States this year," said R. S. Kellogg, Secretary of the News Print Service Bureau, New York City, speaking at the noon luncheon today of the Hibbing Advertising Club upon the subject of "The Advertiser and the Woodpile."

"We are using sixty pounds of news print paper per capita yearly and if put into one sheet it would cover 16,000,000 acres or nearly one-third the area of the State of Minnesota. And at least half of all the newsprint carries the message of the advertiser. The growth of newspapers in size and circulation has been one of the remarkable phenomena of the past twenty-five years. This growth would not have been possible without cheap paper made from wood and without such a medium modern methods of mass merchandising could not have been developed.

"There are more than 2,000 daily newspapers in the United States with total circulations in excess of 26,000,000 copies Sundays and 40,000,000 copies week days. In the metropolitan areas, the daily paper of sixty pages and the Sunday one of two hundred pages no longer excite comment, but their day by day and week by week changes in size furnish a closely watched barometer of business for the advertiser. With a copy of a daily paper for every family in the United States, there is no lack of facilities for placing the merits of goods before prospective purchasers.

"But these large figures of metropolitan papers should not lessen our appreciation of many more local and sometimes older publications. Despite the constantly extending reach of the dailies, there are still more than 12,000 weekly newspapers in the United States of great aggregate importance.

"The commercial unit in news print paper is the ton and to make a ton of paper requires a cord and a half of wood as cut in the forest. It will take nearly three million cords of wood to carry the messages of newspaper advertisers in 1929, so the advertiser has a very real interest in the varied problems of forest conservation. While it will be a long time before conservation measures make the annual growth of our forests equal to the annual demand for wood products, Minnesota is fortunate in having a wide-awake State forestry department, a modern forest taxation system and extensive timberland owners who are taking active steps to put their lands upon a permanently productive basis.

"The recent Minnesota legislature passed some helpful laws," Mr. Kellogg noted during the course of his address. "These include $40,000 for an economic land survey of the timber region of the State, reduction in the tax rate on private land designated for permanent forestry, strengthening of the forest fire laws, and provision for interchange of Federal and State owned lands to facilitate forest management. Other meritorious forestry proposals which failed of passage will doubtless come up again. While the bulk of the original forests of the State has disappeared before axe and fire, there is a large area fit only for timber growing and every reason to believe that with intelligent cooperation of the public, Minnesota can eventually be depended upon for a large annual timber crop."

To Be Assistant Traffic Manager of St. Regis

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., May 21, 1929.—Henry McRorie, of this city, has been appointed assistant traffic manager of the St. Regis Paper Company and its affiliated concerns. He has been connected with the company for several years and in addition is also traffic manager of the Norwood and St. Lawrence Railroad Co. He will continue to make his offices in this city, serving as an aid to Joseph A. Quinlan, of New York, general traffic manager of the firm. Until a few weeks ago Mr. Quinlan made his offices in this city. Late next week Mr. Quinlan will leave for Minneapolis to take part in the continuing hearing before the Public Service Commission on newspaper freight rates. He recently attended a similar hearing in Florida.

Paper Box Convention Takes Place In Toronto

Joint Meeting of National Paper Box Manufacturers' Association of United States and Canadian Paper Box Manufacturers' Association, Attracts Unusually Large Gathering—Benefits of Co-operation and Economic Advantages Derived From Organization

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 20, 1929.—Paper box manufacturers from all over the United States and Canada gathered in convention at the King Edward Hotel beginning May 15 and besides transacting the business of the governing bodies of the industry gave a demonstration of international goodwill as between the two countries. As representing 400 paper box manufacturing firms in the United States and doing a business of over $80,000,000, the National Paper Box Manufacturers' Association sent considerably over half that number of delegates over to Toronto to transact the yearly business of the organization and to join with the Canadian Paper Box Manufacturers' Association, representing over fifty per cent of the manufacturers of the Dominion, in their annual convention. It was the eleventh annual gathering of the National Association and the fourteenth yearly convention of the Canadian association and in the speeches and in the social greetings international unity and fraternity were constantly in evidence. Many of the United States delegates brought their wives and families along and in the line of golf games, motor trips about the city and dinners there was no lacking of entertainment for them. Nor was it all business for the paper box men for during the three-day convention the mornings were devoted to business and the afternoons to golf, with theatre parties in the evenings. Committees of the Canadian association and the Toronto Carton Council had made elaborate arrangements for the entertainment of their guests and these were complete in every detail. The joint convention was admittedly the best the industry in the United States and Canada have yet staged.

The National Association Convention got under way on the morning of the 15th, following a civic welcome by Mayor McBride, when Walter E. Trum, president, gave his address which dealt largely with the benefits of co-operation within the paper box industry and the economic advantages that had been derived from the organization, both from a manufacturers' and a distributor's standpoint. Public attention and sympathy had displaced a feeling of mistrust in the United States in respect to trade organizations as exemplified by the National Paper Box Manufacturers' Association, which was looked upon as a stabilizer of business and an instrument for improvement in relations between the general public and the producer and distributor of manufactured goods.

In his address of welcome to the gathering, Robert S. Dunlop, president of the Canadian Paper Box Manufacturers' Association, sketched the growth of his association and stressed the benefits that had accrued to the industry in Canada through the organized effort put forth by the central and localized bodies, such as the Toronto Carton Council, and Edward P. Radford, of the Advance Paper Box Company, St. Louis, chairman of the Western Division of the National association, in his report, stated that results were becoming evident following policies of education and co-operation introduced in paper box centers throughout the western section. W. Clement Moore, of Philadelphia, spoke on "Invisible Masters of Modern Business" and a very entertaining feature was an able address by Charles Milton Newcomb, of Cleveland, Ohio, on "What We Are Afraid Of."

The Paper Box Market

Dealing with the subject of the paper box market in the United States, Charles Matthias, of Philadelphia, pointed out that sales of paper boxes totalled $89,000,000 per year, which meant that each person was spending 80 cents on the product. Canadian sales totalled approximately $12,000,000, or $1.20 per year for each individual. From this the speaker inferred that the Canadians were the better salesmen. He declared that in the past the industry had neglected the vital question of salesmanship, forgetting that the problem of selling was the life blood of business. He urged that the paper box manufacturer study not only his market but his customer as well. Speaking on the subject of credit losses, Maxwell S. Mattuck, of the National Association of Credit Men, explained the advance that has been made in the framing of statutes against thievery and the elimination of fraud in bankruptcy proceedings.

The Value of Sales Plans

Following a description of the operations of the United States Department of Commerce by Gorton James, Chief of the Domestic Commerce Division, J. Ralph Blocher, of the research department of the Mohawk Carpet Mills, who has a wide connection with the paper box industry in the United States, gave a talk on marketing, in which he declared that in previous conventions manufacturers of paper boxes had been urged to concentrate on new designs and styles. Today new designs and styles were taken for granted and they were not enough. If sales and production campaigns were to be successful they would have to be accompanied by merchandising plans in which the mill man had to be equipped to discuss the consumer's problems, leaving the box itself as an incidental feature to be discussed last. His idea was to sell by way of merchandising plans instead of through the box itself, which would mean that the price, in many cases, would take care of itself and certainly not suffer. There would be no doubt as to the outcome of a sale if a plan was presented that would carry the paper box product through to the consumer. From the Canadian standpoint, G. M. Hobart, London, Ont., discussed the profit and loss statement of convention attendance and Addrew G. Burry, Fort Wayne, Ind., presented the same topic from a United States standpoint.

W. E. Trum Again Heads International Body

The closing afternoon of the convention was devoted to sectional meetings in which the various district associations transacted their business and perfected their organizations, while reports were presented by resolutions and nominating committees. W. E. Trum, of Brooklyn, was again selected for the president's chair, with George J. Kroeck, of Chicago, as vice-president. Sectional directors were appointed as follows: Director for the Western Division, Eugene Davis, Cleveland; Central Division, William P. Datz, Jr., Philadelphia; New England, Everett F. Young, Providence, R. I.; Eastern Division, M. Densen, New York; Southern Division, James H. Hickman, Knoxville, Tenn.; Treasurer, Frank S. Records, Philadelphia.

Canadian Association Meets

The annual meeting of the Canadian Paper Box Manufacturers' Association, held following the annual dinner which was attended by many members of the International body, was largely confined to routine matters. President Robert S. Dunlop presided and the report of the secretary, C. V. Hodder, dealt with the five months period since he assumed office. Increased interest and co-operation were evident by enlarged membership and added activity, while the association generally was reported to be in a most healthy condition. Increase of interest in the association work was noted by the various districts, particularly Eastern Canada, where excellent results were accruing to the advantage of the paper box industry at large. There was a general discussion on the subject of chain store development and doubt was expressed as to whether

such institutions were of any benefit to the paper box makers. Votes of thanks were passed to the retiring president, Mr. Dunlop, and to the various committees which had helped make the convention one of the best the international organization had ever staged. Officers of the Canadian Association were elected as follows: president, J. J. Small, of the Guelph Paper Box Company; vice-president, W. E. Frankish, Empire Paper Box Company, Ltd., Montreal; directors, T. A. Moisan, Standard Paper Box Company, Montreal; C. M. Prescott, A. E. Long & Co., Ltd., Toronto; G. M. Hobart, Sommerville Paper Box Company, London, Ont.; R. S. Dunlop, Dominion Paper Box Company, Toronto; C. V. Hoddart, secretary.

Buntin Reid Co. To Build

The Buntin Reid Company, the oldest paper house in the Dominion, established in 1856 and operating on Colborne street in the down town district of Toronto, has purchased a site for a new building to be its new paper distribution and storage warehouse. The vacant lot acquired is the southwest corner of Charlotte and Oxley streets in the King-Spadina district, which will cover the whole lot, 70 by 170 feet, on which will be erected a specially designed fireproof structure with all modern facilities for handling the company's business. A special feature will be the provision of parking space in the building for customers' cars. The whole building will be occupied by the owners and the investment will be about $175,000. Expansion of business has necessitated the removal of the Buntin Reid Company from their premises at Colborne and Scott streets, which building they have occupied since leaving Wellington street following the big fire of 1904.

High Mark Reached in Forestry

Deputy Minister C. A. Zavitz, of Toronto, who has been in consultation with the District Forester at Sault Ste. Marie, Ont., in connection with reforestation activities in that district, recently surveyed the location of the proposed planting there of 1,200,000 trees within the next two months. Reforestation on a large scale has been commenced at Kirkwood and the barren lands adjoining. This is by far the largest undertaking of its kind that has been attempted in Ontario, and will be largely experimental and a guide in future operations. Mr. Simmonds, of the Forestry Department, is in charge of the work.

Notes and Jottings of the Trade

T. L. Crossley, of Toronto, addressed a meeting of the Employees Mutual Benefit Association of the International Paper Company, Niagara Falls, N. Y., a few days ago. As director of the field work of the Institute of Industrial Arts, Mr. Crossley during his talk showed a number of slides, including some views of Canadian paper mills. Others demonstrated the manufacture of fiber, the effect of beating and the results of fungus growths.

On the eve of his departure from Toronto, R. B. Hall, formerly manager of the Toronto office of the Howard Smith Paper Mills, was presented with a golf bag by the members of the staff, Charles F. Mansell, dean of the paper trade, making the presentation. Arthur Hobson, manager of the Toronto office, expressed regret at Mr. Hall's departure at an informal gathering, and other members of the staff referred to the pleasant associations about to be severed. Mr. Hall is now sales manager for the Canada Paper Company, with headquarters at 407 McGill Street, Montreal.

At the annual meeting in Toronto this week of the Toronto branch of the Canadian Manufacturers' Association, Walter S. Barber, of Provincial Paper, Ltd., C. V. Syrett, of the C. V. Syrett Paper Company, and A. M. Dunn, of Wirebound Boxes, Ltd., were elected members of the executive committee.

All four machines of the Abitibi Power and Paper Company at Sault Ste. Marie, Ont., are now operating, No. 2 machine having been placed in commission on May 1. This is the first time that all the machines at the mill have been in simultaneous operation since last November. The starting of No. 2 machine adds about 25 men to the wage roster, making the staff of the mill complete. It was stated that there was no immediate prospect of additional machines being placed in operation at the Espanola mill of the company.

A. Huntley, who for some years was connected with the Hodge-Sherriff Paper Company, both in Toronto and Montreal, has severed his connection with that organization and is now engaged in the bond and brokerage business in Montreal.

Mississaga Pulp and Paper Company, Ltd., with head office at Port Credit, Ont., has been granted Ontario incorporation with an authorized capital of $300,000 and power to carry on business as manufacturers of mechanical and chemical pulp and to operate paper mills. A firm of Toronto lawyers are named as the incorporators and their names are given as provisional directors.

The Interlake Tissue Mills, Ltd., at Thorold, Ont., have completed a large addition to their plant which will be used for storage and for the manufacture of the company's crepe lines.

George Chalice, of the Riordon Sales Corporation, a subsidiary at Montreal of the Canadian International Paper Company, was a business visitor to Toronto a few days ago.

The mill formerly operated by Superior Paper Mills, Ltd., at Thorold, Ont., is undergoing repairs and remodeling for the Brantford Roofing Company, which organization has taken it over. Manufacture of roofing papers will shortly be commenced there.

John Martin, a well known paper man of Winnipeg, called on the paper trade in Toronto recently.

New England Opposes Higher Freight Rates

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 20, 1929.—New England shippers are planning to unite in fighting eastern class rate proposals, which contemplate advances in the annual freight bill of this section of the country amounting to many millions—some have estimated the amount at $10,000,000 a year. The matter was discussed at the annual meeting of the New England Traffic League at the Boston Chamber of Commerce, Tuesday evening, May 14. F. N. Putnam, of the Gummed and Coated Paper Company, Nashua, N. H., was elected a member of the board of directors at this meeting.

The increase would result if the proposals are adopted and would prevent shipments of goods from New England to the western United States by the way of Canada, for which a lower rate is charged. For years New England has been privileged to ship into the West via rail routes through Canada, at rates somewhat lower than prevailed by standard routes operating wholly within the United States. These routes enable New Englanders to ship into the Middle West under most favorable rates and in times of stress or periods of congestion, these routes, have, time and again, been New England's salvation.

It was said at the meeting that some of the American roads located outside of New England would like to see these Canadian routes abolished, because they take from them tonnage which otherwise they might have. It was reported that efforts in this direction are being made. If carriers should be successful in this move, there would be taken away the only justification, according to the examiner who heard the case, for continuing westbound from this section to the Middle West the New York basis of rates.

New England shippers realize the hardship from a rate standpoint such adjustment would impose on industry. At the meeting it was decided to take steps immediately to interest the state governments in this situation, as well as to emphasize to New England carriers the importance of joining with the shippers in a determined effort to hold such slight advantages in transportation as New England now enjoys.

Gummed Industries To Meet June 19

The regular summer meeting of the Gummed Industries Association will be held at the Hotel Clifton, Niagara Falls, Ontario, on June 19. Among topics for discussion at this meeting are improvements of the statistical service of the association, cost accounting methods for the industry, standardization, etc.

Fox River Valley Mill Additions Nearly Ready

New Unit At Northern Paper Mills, Green Bay, Which Will House Shops and Offices and Provide Additional Storage Space For Pulp, Taking Shape Rapidly—Another Addition Almost Completed to House New Machine—Talulah Mill Enlargement

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 20, 1929.—Two mill additions in the Fox River Valley are taking shape rapidly. One of these is a new unit 70 by 200 feet in size at the Northern Paper Mills, Green Bay, Wis., with an estimated cost of $72,000. This building is to be of brick and concrete, and three stories high. It will house several shops and offices and will provide additional storage space for pulp. It adjoins the main mill and beater plant. The company has the addition almost completed which will house its new No. 7 paper machine, now being built by the Beloit Iron Works. The total amount of the improvements this year at the Northern will be about $250,000.

The other addition is an enlargement of the finishing room at the Telulah mill of the Fox River Paper Company, Appleton, Wis., costing about $50,000. It will be 85 by 117 feet in size, using face brick, concrete and steel. C. R. Meyer & Sons Co., Oshkosh, Wis., has the contract. This new section will be used as a loft for drying paper. New high speed cutters and lay-boys will be installed. Most of the drying will be done in the new loft, according to E. L. Small, chief engineer.

Kaukauna Mill Shut Down

Cessation of operations and abandonment of the mill at Kaukauna, Wis., sometime before July 1, has been announced by R. H. Jacoby, resident manager of the Union Bag and Paper Company. One of the oldest and largest industries in Kaukauna thus goes out of existence.

Inability to manufacture bag paper profitably at a point so far removed from the pulp supply is the reason given for the change. Several months ago the bag department was moved to a new plant at Orange, Texas, but the paper machinery was kept in operation at Kaukauna. Now the two paper machines will be shut down permanently, as will the equipment for making sugar bags.

About 85 persons have been employed at this mill. It was moved to Kaukauna in 1900, after the concern had taken over the Western Paper Bag Company, of Batavia, Ill. The mill buildings were put up more than forty years ago, and in the early days the company was known as the Kaukauna Paper Mill.

Wisconsin Carton Co.'s Plant Nearly Ready

Production will be started early this summer by the Wisconsin Carton Company, of Stevens Point, Wis., according to announcement of officials. The former Trenham Tractor Company plant is being remodeled to make it suitable for this industry. Concrete floors will be laid before the machinery is installed. Orders are being placed now for the carton making equipment. J. T. Mader, vice president and production manager, has moved from Appleton, Wis., to Stevens Point, Wis., to take charge of operations. L. R. Anderson, of Stevens Point, is secretary-treasurer and will act as manager.

News of the Industry

Stock of the Kimberly-Clark Corporation, Neenah, Wis., is now listed on the New York Stock Exchange. Application was made for the entry about a year ago when the company was re-organized, and the request has now been granted. The stock was traded on the New York Curb Market for the last year.

Destruction of the plant of the Badger Paper Mills Company, Peshtigo, Wis., was threatened last week when fire broke out in the wood department. Employees of the mill and the local fire department were able to check the flames before they could spread, and the damage was slight. The company has been overhauling the pulp and paper mills, preparatory to starting operations.

M. W. Hanna, production manager for the Whiting Plover Paper Company, Stevens Point, Wis., has resigned. He is forming a corporation which will deal in radio and electrical appliances, with stores at Stevens Point and Wisconsin Rapids, Wis.

Edward Walk, a foreman, has been appointed assistant tour boss of the Marinette and Menominee Paper Company, Marinette, Wis. He will be aide to Henry Deplanche, day tour boss of the paper department. Gustave F. Zoellner, a machine tender, has been promoted to foreman to succeed Mr. Walk.

Offices of the Kimberly-Clark Corporation and the Bergstrom Paper Company, Neenah, Wis., are now operated on a daylight saving basis. Employees start their day at 7:30 in the morning and depart at 4:30 in the afternoon. This system is employed every summer.

S. F. Shattuck, vice president of the Kimberly-Clark Corporation, Neenah, Wis., has been honored with election as president of the Neenah Rotary Club.

John N. Bergstrom, of the Bergstrom Paper Company, has purchased a large residence in Neenah, Wis. The property formerly was owned by John P. Shiells, former president of the First National Bank, of Neenah. Mr. Shiells and Mrs. Shiells are planning to move to California to reside.

Dredging has been started by the U. S. Engineering Department preparatory to completing the 1150-foot dam on the Fox River at DePere, Wis. Last year the sluiceways, 360 feet long, were rebuilt and the spillways will be built this summer. One of these is 400 feet long, and the other 390 feet. When all of this work has been done, the wooden dam that has served for decades will be entirely replaced by concrete and steel construction. The dam is one of the longest on the river. Nelson Whiteman, of the Appleton district of the U. S. Engineering Department, is in charge.

The Hawaiian Islands are proving a good market for the Tuttle Press, Appleton, Wis., makers of crepe paper products and other specialties. A carload of Paris crepe recently was shipped to Honolulu, where it is found that the natives use it extensively for making novelties such as necklaces and bracelets.

Selective logging probably will be followed in the future more than ever in Wisconsin as a means of conserving the timber supply. This method is being advocated strongly by the Wisconsin College of Agriculture for reasons which have been discovered through extensive experiment. It has been found that selective cutting causes a quicker and larger yield of timber than is found on virgin tracts or clean-cut areas. The practice has been followed for some time by some lumber companies, but probably will become more general since the research was completed.

A gift of $50,000 has been made to the new hospital at Kapuskasing, Ont., by F. J. Sensenbrenner, of Neenah, Wis. The money will be used for equipment. Mr. Sensenbrenner is president of the Spruce Falls Power and Paper Company, Ltd., which has its mill at Kapuskasing, and also of the Kimberly-Clark Corporation, Neenah, Wis.

Paper mills along the Fox River had low water for twenty-four hours last week when all the sluice gates were closed at the head of the river. This was done on government orders when efforts were made to find the bodies of two paper mill workers, August Mollen and George VanBerkel, of Little Chute, Wis. The men

were drowned while fishing, when their boat capsized. The bodies had not been recovered at the close of the week.

W. J. Ribel, who a number of years ago was manager of the Peshtigo Paper Company, Peshtigo, Wis., has established his residence at Menominee, Mich. He had been living in California for some time, but plans to spend his summers at Menominee and his winters in California.

George W. Mead, president of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., is one of five men suggested as an arbitration board in the settlement of the strike of Allen-A Hosiery Company workers at Kenosha, Wis. His fairness and attitude toward union labor led to his choice by the knitters' unions. The strike has been in progress for more than a year and an attempt is now to be made to settle the difficulties.

Relates Growth of Bag Company

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., May 13, 1929.—The story of a paper bag and a piece of string, upon which a new industry was founded ten years ago and which has grown into a corporation capitalized at $500,000, now recognized as the largest manufacturer of quality paper shopping bags, was told last week by Walter H. Duebener, president of Deubener's Shopping Bag, Inc., at a dinner in the Columbia Club in honor of veteran employees and department heads of the corporation.

Until recently, the business now conducted by the corporation was carried on as a partnership by Mr. Deubener and Lydia Deubener, his wife, who last year moved the business from St. Paul, Minn., to a new and modern plant at 2702 Applegate street.

As an expression of appreciation for past services and future efforts certificates of beneficial interest in the Deubener Employees' Trust were presented by Mr. Deubener to each employee present at the dinner. He explained that the gift represented a working interest in the business they had helped build.

Mr. Deubener also stated that the customary Christmas bonuses would be continued, depending on business operations during the balance of the year.

Mr. Deubener said that added permanence and strength had been given the rapidly growing business by its corporate form and that the organization had been extended by the addition of R. F. Geddes, who has become vice president and general manager. Mrs. Deubener, he said, will be secretary-treasurer of the corporation. Business and manufacturing policies which have dominated the manufacture and sale of shopping bags will be unchanged, he announced.

Mr. Deubener recalled that he first conceived the idea of making a paper shopping bag ten years ago when he and Mrs. Deubener were managing a grocery in St. Paul. He gave credit to the help of Mrs. Deubener and the loyalty of their customers and employees entertained at the dinner as one of the chief reasons for the growth and expansion of the business.

Deubener's Shopping Bag, Inc., at present manufactures and distributes its product throughout the United States and in a number of foreign countries.

U. S. Corrugated Warehouse Burned

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., May 21, 1929.—Fire of undetermined origin recently destroyed the warehouse of the Unted States Corrugated Paper Box Company, Indianapolis. Preliminary estimates place the loss at $200,000, all of which is covered by insurance. Two firemen were injured, neither seriously. A dozen more escaped injury when the south warehouse wall collapsed and hurled burning beams more than 100 feet. Firemen were hampered by lack of water. Within a half hour, however, fourteen pumpers were boosting pressure through 40 lines of hose.

Except for the fourth floor of the factory proper, the flames were confined to the two-story warehouse, which was shut off from the main building by firedoors which automatically closed when the heat became great.

Kramfors Aktiebolag

The development and organization of Kramfors Aktiebolag, of Stockholm, Sweden, is the subject of an exceptionally interesting and attractive book, of which the author is Baron Johan Mannerheim, managing director of the organization. Baron Mannerheim describes comprehensively each branch of the companies' activities. The work is beautifully printed on Rotogravure paper and is profusely illustrated.

In its early history a company possessing only forests and saw mills, the author describes how Kramfors Aktiebolag decided in 1905 to extend its industrial activities by building a sulphite pulp mill. This was erected at Kramfors and was put into operation in 1907.

As early as 1908, Kramfors had bought up all the shares in Frano Nya Aktiebolag, a company owning a sulphite mill at Frano. This mill was transferred to the direct possession of Kramfors in 1918.

During the years 1915 to 1918 a water supply station for the supply of electricity for the mills was erected at the waterfall Oxagardforsen, in River Faxe, at Edsele.

In 1915 Kramfors started a steamship company called Rederiaktiebolaget Wilhelmina and in the following year purchased the shares in the steamship company, Rederiaktiebolaget Hernodia. The name of the latter company was later changed to Rederiaktiebolaget Fredrika.

From this time Kramfors have possessed, besides their own fleet of ships, their own forests conveniently situated by watercourses for timber floating, their own proper station, saw mills, planing mill, a box board factory and also sulphite and sulphate pulp mills. The pulp mills being connected with the saw mills by an overhead conveyer has made it possible for the wood to be utilized in the most economical way.

The United States representatives of Kramfors Aktiebolag are Johaneson, Wales & Sparre, Inc., with offices at 250 Park Avenue, New York.

2,000 lb. Coupling Installed at Corinth

A 9½ Ajax Flexible Coupling was recently shipped to the International Paper Company at Corinth, N. Y., for installation between a water wheel and a speed increaser. The coupling will be used to transmit 1200 hp. at 220 rpm. It weighs 2000 pounds.

This installation is unusual in that the coupling is the largest of its kind ever built. Engineers of the above company decided to purchase this coupling due principally to its simplicity, resistance to severe operating conditions and the fact that it requires absolutely no maintenance.

In the past many engineers have erroneously maintained that a coupling of this type (pin, bushing and rubber bumper) would not stand up in the larger sizes. This theory has been definitely disproved and couplings have been built up by the Ajax Flexible Coupling Company in large sizes for heavy duties up to 12 inch bore. Further information on the design and application of rubber bumper couplings in the larger sizes may be obtained by writing the Ajax Flexible Coupling Company, Westfield, N. Y.

Site For Bates Valve Bag Corp.

[FROM OUR REGULAR CORRESPONDENT]

OSWEGO, N. Y., May 21, 1929.—The property of the Oswego Industries Corporation has been selected as the site for the new machine manufacturing plant of the Bates Valve Bag Corporation and construction work will be launched early next week. The site which has just been surveyed by company engineers is near the plant of the Taggart Paper and Bag Corporation. For the past several weeks engineers have been debating on the exact location of the structure which will be 200 feet wide and 400 feet long. J. E. Crandall, chief engineer of the St. Regis Paper Company, with other officials of the engineering staff, have just concluded a conference with city authorities relative to the various details connected with the building of the plant.

Chicago Paper Market Exhibits Improvement

Although Margin of Gain Was Only Slight In Some Cases, Outlook For Future Is Promising—Conditions In News Print Industry More Satisfactory Than of Late—Fine Paper Section In Sound Position—Paper Board Production Slightly Off At Present

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 20, 1929.—A general improvement which seems to have affected the entire paper market in Chicago and vicinity is noted in this weeks reports from various paper executives. While the margin of improvement is only very slight in some cases, the general tone of the market is noticeable and worthy of comment.

News print continues in a satisfactory condition, with production around 80 per cent—the demand and the new prices having had a good effect on the news print market. The demand for book papers and for cover papers continues to improve with no change in prices and the market stable. Fine papers are satisfactory with the second quarter of the year definitely near enough to promise good reports for the first half of 1929 for fine papers and the complete line of higher grades.

It is reported that production is slightly off in board as the result of a somewhat depressed demand. This condition seems to be only for the week and is not causing any alarm whatsoever. The biggest trouble in the board market continues to be in reported price cutting which is making any profit whatsoever a rather hard proposition to get. Wrapping papers are said to be in satisfactory condition. Ground woods, weak for some weeks, are improving. The activity in waste papers is good although there is some weakness reported in the lower grades.

Paper Board Men to Discuss Trade Practices

Reports from reservations at the Palmer House Hotel for the coming meeting of the Paperboard Industries Association indicate a very satisfactory attendance according to H. S. Adler, secretary. The two-day meeting will get under way next Wednesday, May 22, and will continue until Thursday afternoon. Committee meetings, on Tuesday, May 21, will assist materially in outlining the complete program up for discussion. The long and fruitful efforts of the Paperboard Industries Association in relation to trade practices seem to be coming to head if the program for the coming Chicago meeting can be accepted as any criterion.

A Trade Practice Division Industry Committee will meet on Tuesday afternoon, a trade practice session will take the entire morning on Thursday, beginning at 10:00 a. m. at which time the entire industry will meet for further consideration of the Trade Practice Plan and to receive the report of the Board of Directors of the Trade Practice Administration, and trade practices are expected to assume an important part in the group sessions of the Folding Box, Paperboard and Container Divisions of the Association.

A real drive for representative attendance at the Chicago program is being based on an invitation to all manufacturers of paper board, containers and folding boxes to attend not only the Group meetings and the Mass Meeting on Thursday morning but also the General Association Meeting on Thursday afternoon, May 23. The association is anxious to get the entire industry whipped into shape in order that decisive action may be taken on trade practice activity which is expected to raise the industry to the proper plane.

New Association Plan Successful

The first meeting of the Chicago Paper Association to be held under the new plan which divides members into those selling to retail and miscellaneous fields and those selling to industrials, took place last Tuesday evening, May 14 and indicated that the procedure was to be a success in every particular. D. F. Peck, vice president in charge of the retail division, and Earl Beyer, presiding over the industrial section, both reported unusual interest in the new proceedings which is expected to give both divisions a better opportunity to work advantageously than if the entire membership met in one group. According to Leo Altholz, president, the association has finished its general study of surveys relative to the subject of net profit control, etc., and is now occupied in an exhaustive study of individual items on the surveys including such items as office expense, cartage, insurance, etc. At the last meeting the subject of office expense was taken up and the details of the cartage problem are expected to take most of the time of the next meeting—the subjects to be handled by the two groups and thus from the standpoint of each of these divisions.

Chicago was host this week to the International Advertising Association and to a number of affiliated organizations in the advertising and publishing fields. Of general interest to members of the paper industry was the interesting discussion of the changed economic order; the importance of research work in this new economic order; disciplining of business; promoting better advertising education; closer cooperation of the three advertising interests—publisher, advertiser and advertising agency; of an understanding of the buying problem and a discussion of more complete investigational work by the manufacturer and distributor. These important subjects were discussed by an important group of executives.

The consensus of opinion garnered from newspaper reports and personal observations indicated that the advertising world believed the conference highly satisfactory and looked for it to assist materially in stimulating the correct development of advertising. An important outcome may be the bringing of the science of advertising and market research closer to the merchandising field to improve the knowledge of advertising on the part of business men. This, properly applied, should act as a stimulus for the greater use of not only publication and newspaper advertising but of direct mail as well. This fact, undoubtedly, partly explains the unusual interest Chicago paper executives took in the International Convention just concluded.

Shuler & Benninghofen To Build

DAYTON, Ohio, May 14, 1929.—The Shuler & Benninghofen Company, at Hamilton, is preparing for the cnstruction of an addition to its mills which will cost $20,000 at Pleasant and Symmes avenues.

A building permit already has been issued in the office of Jacob Braun, city building inspector, and no time will be lost in beginning operations and completing the addition.

The building will be erected by C. T. Beeler, contractor. The structure will be 154 by 83 feet in dimensions and will afford considerably more space for mill operations. The building will front on Symmes avenue.

The Shuler & Benninghofen Company is one of the oldest felt mills in the Miami Valley and one of the best known in the country. It was founded about the time of the Civil War and since that time the mills have turned out an excellent product, now in use in many paper mills throughout the country.

The founders have been succeeded by members of the original family in the conduct of the business which ever has been kept on the high plane established by the forefathers.

That increased facilities that are required indicates a steady, healthy growth in the business.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Canton, N. C.—The Champion Fibre Company, Canton, is said to have plans under way for new additions to plant for increased capacity, to be carried out in connection with a general expansion and improvement program to cost upward of $200,000, with equipment. The work will include a new laboratory structure.

Appleton, Wis.—The Fox River Paper Company, South Appleton street, has taken out a permit for the immediate erection of proposed new addition to mill referred to in these columns last week, to be used as a finishing room. The structural steel framing contract has been let to the Vulcan Manufacturing Company, Fond du Lac, Wis. The unit will be located on Island street, and is reported to cost approximately $70,000, with equipment.

York, Pa.—The Pulp Production Company, recently organized by Harry E. Snyder, 149 South George street, York, and associates, with capital of 25,000 shares of stock, no par value, plans operation of mill in this vicinity for the production of wood pulp as well as paper products. It is understood that work will begin at an early date. Mr. Snyder will be treasurer of new organization. Harry A. Robinson and Horace W. Myers, 47 North Sumner street, are also interested in new organization.

Long Island City, N. Y.—The National Container Corporation, Long Island City, has been chartered with a capital of 140,000 shares of stock, no par value to succeed to and expand the company of same name with plant on Review Avenue, Long Island City, specializing in the manufacture of corregated boxes and containers. It is understood that facilities will be provided for enlarged output. The company represents a merger of the Columbia Corregated Company, William Herman & Co., Inc., the New York Corregated Company, and the International Corregated Company, all of Brooklyn and New York.

Fort Wayne, Ind.—The Fisher Brothers Paper Company, Fort Wayne, is having plans prepared for a one-story building, 72 x 150 feet, at plant at Lafayette and Main streets, to be used primarily for automobile service and garage, reported to cost close to $25,000, with equipment. A. M. Strauss, Cal-Wayne Building, Fort Wayne, is architect.

Bellingham, Wash.—The Puget Sound Pulp and Paper Company, recently organized to take over and consolidate the San Juan Pulp Manufacturing Company, with local mill; the Fidalgo Pulp Manufacturing Company, with plant at Anacortes, Wash., and other interests, is said to have plans maturing for proposed new pulp mill in this vicinity, for which site has been selected. The initial plant will consist of several units, equipped for an annual output of approximately 50,000 tons of high grade bleached sulphite pulp, and for which forest wood only will be used as raw material. The project will include a large sawmill on neighboring site and in which, it is understood, the Coos Bay Lumber Company, San Francisco, Cal., will be interested. The entire development is reported to cost close to $3,000,000. Homer Bunker, president of the Coos Bay Lumber Company, is chairman of the board of directors of the Puget Sound organization; and Ossian Anderson, heretofore president of the San Juan and Fidalgo companies, will act in the same capacity for the consolidated organization.

Brooklyn, N. Y.—The Paper Box Manufacturing Corporation, recently organized by Samuel I. Posen, 284 Eastern Parkway, Brooklyn, and associates, with capital of $20,000, is said to be planning early operation of local plant for the manufacture of paper boxes and containers.

Chicago, Ill.—Plans have been perfected for a consolidation of the Wilson-Jones Company, Franklin Building, Chicago, and the Irving-Pitt Manufacturing Company, 802 Locust street, Kansas City, Mo., both manufacturers of loose-leaf forms and other commercial paper goods. The first noted company will retain present name, while the latter will be known in the future as the Irving-Pitt Division of the Wilson-Jones Company. In connection with the consolidation, it is understood that an expansion program will be carried out for increased capacity; the Irving-Pitt plant will be continued at present location.

San Francisco, Cal.—The Consolidated Paper Box Company, 346 First street, has awarded a general building contract to Barrett & Hilp, 918 Harrison street, for the construction of proposed new plant addition on Gilbert street, near Brannan street, referred to in these columns last week. Superstructure will be placed under way at once. It will be three-story, reinforced concrete, estimated to cost more than $100,000, with equipment. Hyman & Appleton, 68 Post street, San Francisco, are architects.

Gordon, Ga.—The plant and property of the Pynetree Paper Company, Gordon, idle for some months past and in charge of James M. McCaw, trustee, has been acquired by the Nashville Industrial Corporation, Old Hickory, near Nashville, Tenn. It is understood that the mill will be dismantled and the machinery offered for sale by the purchasing company. The plant property also, will be placed on the market.

Philadelphia, Pa.—William K. Grauer's Sons, Inc., has been chartered under state laws with capital of $100,000, to take over and expand the company of same name with plant at 1832 Frankford Avenue, manufacturer of wall paper, ceiling papers and kindred products. It is understood that increased capacity will be arranged. The new company is headed by Edward M., T. Harvey and Wesley Grauer; the last noted will be treasurer.

Providence, R. I.—The Purity Paper Dish Company, recently formed with capital of 100 shares of stock, no par value, will operate a local plant for the manufacture of paper goods, including paper cups, dishes and kindred pressed specialties. The new company is headed by Peter W. McKiernan and John C. Going, both of Providence.

Chicago, Ill.—The Evans Fibre Box Company, 3301 West 47th. Place, manufacturer of fibre boxes, containers, etc., has superstructure in progress on new plant unit for enlarged output, to be one-story, 135 x 250 feet, and proposes to have the unit ready for service at an early date. It is reported to cost close to $100,000, with equipment. A Epstein, 2001 West Pershing Road, Chicago, is architect and engineer.

Parsons, W. Va.—The plant and property of the Whitmer-Parsons Pulp and Lumber Company, Parsons, which has been

under receivership and inactive for some months past, has been acquired by the Parsons Realty & Machinery Company, recently organized by C. W. Minear and Hugh Pritt, both of Parsons. The property will be taken over at once and includes two large tracts of land, mill site, equipment and all other holdings of the Whitmer-Parsons organization. No announcement has been made by the purchasing company regarding plans for the acquisition, but it is reported that the mill will be dismantled and the equipment sold.

Cincinnati, Ohio—The Cincinnati Rubber Manufacturing Company, Franklin avenue, Norwood district, specializing in the manufacture of rubber rolls for paper-making machinery, has approved plans for a new one-story addition to plant, for which general contract has been let to the Austin Company, Dixie Terminal Building, Cincinnati. It is reported to cost more than $45,000, with equipment, latter to include a 10-ton bridge crane.

Stevens Point, Wis.—Following the recent leasing of local building by the Wisconsin Carton Company, 902 North Division street, Appleton, Wis., and development of plans for concentrating production at this point for time being, the company will hold in indefinite abeyance the construction of a recently projected plant at Neenah, Wis. It is proposed to provide facilities for extensive output at the Stevens Point mill. B. C. Koepke is president.

New Companies, Etc.

Boston, Mass.—The Crosby Folding Box Company has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in folding paper boxes and other containers. M. Frank Corcoran is president; Bertram C. Eastman, 29 Boston avenue, West Medford, treasurer.

Milwaukee, Wis.—Paper House of Milwaukee, Inc., has been incorporated with capital $10,000, to deal in paper goods. The incorporators are Joseph A. Wolf, 860 Fortieth street; and Theodore Schwaab, both of Milwaukee. The first noted is representative.

Springfield, Mass.—The Liberty Wall Paper Company, Inc., has been organized with a capital of 100 shares of stock, no par value, to manufacture and deal in paper products. William Hechler is president, and Benjamin Hechler, 26 Jefferson Avenue, Springfield, is treasurer and representative.

Newark, N. J.—The Bergen Paper and Bag Company, has been incorporated with capital of $10,000, to manufacture and deal in paper bags and other containers. The incorporators are Jacob Glick and Samuel L. Diener, 24 Commerce street, Newark. Last noted is representative.

Racine, Wis.—The Badger Gummed Tape Company, Grange and Eighteenth streets, has been incorporated recently by N. A. Young, George W. Liedrich and H. E. Wilson, Racine, to manufacture and deal in paper tapes and kindred products.

Chicago, Ill.—The Northern Box Company, 4909 Catalpa street, has been incorporated with capital of $1,000, to manufacture and deal in corrugated paper boxes, cartons and other shipping containers. The incorporators are Herbert E. Burhop and Edwin Burhop.

New York, N. Y.—The Burkhardt Paper Mills, Inc., has been incorporated with a capital of $100,000, and 3,000 shares of stock, no par value, to manufacture pulp and paper products. The new organization will be represented by Kirk & Diamond, 551 Fifth avenue, attorneys.

Paterson, N. J.—The Paterson Paper Box Company, has been incorporated with a capital of $100,000, to manufacture paper boxes and containers, as well as paper novelties. The incorporators are Robert A. Issacs and Roy Sommers, 94 Sheridan avenue, Paterson. The last noted is representative.

New York, N. Y.—The Bi Water Paper Corporation has been incorporated with a capital of 100 shares of stock, no par value, to manufacture and deal in paper goods of various kinds. The company will be represented by L. A. Shapiro, 1540 Broadway, attorney.

COST AND TECHNICAL MEN MEET

(*Continued from page 31*)

J. V. B. Fox, Rex Thomas, C. L. Bachelder, E. J. Turner, all of Paper Makers Chemical Corporation; N. J. Cowie, Hawthorne Paper Company; Miss Ida Montague, Hawthorne Paper Company; Karl Schneider, Hawthorne Paper Company; Glen Ingling, Kalamazoo Paper Company; E. F. Whittington, Sutherland Paper Company; Thomas Shepherd, Sutherland Paper Company; Kent Kidder, P. E. Jakeway, W. E. Pancoast, Howard L. Venderberg, all of Allied Paper Mills; L. R. Verdon, V. G. Heimuller, L. H. Larson, all of Kalbfleisch Corporation; Plainwell—Frank Brown, C. B. Barton, Jr., Ed Crowell, all of Michigan Paper Company; Vicksburg—Harold F. Dewey, Lee Paper Company; Max Bardeen, Lee Paper Company; Watervleit—Severens Balch, George Ferguson, H. F. Farum, Watervleit Paper Company; Three Rivers—H. C. Lott, Eddy Paper Corporation; Battle Creek—Herbert Davey, Postum Cereal Company; Harbor Beach—C. B. Smith, Huron Milling Company; Monroe—W. H. Kimball, Consolidated Paper Company; Munising—W. A. Munro, Paul Hodgdon, Munising Paper Company; Muskegon—C. D. Goodwin, Central Paper Company; Wyandotte—H. G. Potts, D. P. Smith, Pennsylvania Salt Manufacturing Company; Port Huron—Burnett Kavanagh, Port Huron Sulphite and Paper Company.

Wisconsin: Appleton—C. S. Brazeau, Appleton Machine Works; Madison—F. A. Simonds, Forest Products Laboratory; Stevens Point—Th. C. Bentzen, Whiting Plover Paper Company; Kaukauna, Ivar Lundbeck, Thilmany Pulp and Paper Company.

Ohio: Dayton—K. P. Geohegan, Aetna Paper Company; West Carrolton—O. P. Gephart, Oxford Miami Paper Company; Cleveland—C. B. Giebel, Grasselli Chemical Company; Hamilton—C. F. Neiderman, Beckett Paper Company; A. J. Wildman, Beckett Paper Company; Middletown—E. E. Grant, Crystal Tissue Company; Chillicothe—E. F. Bearse, Chillicothe Paper Cmpany; Middletown—George Tyler, Crystal Tissue Company; Cleveland—A. L. Whiteside, Hill Clutch Machine and Foundry Company.

Illinois: Chicago—Charles Raney, Thomas Hans, Lois Hans, L. E. Longstreth, all of the Container Corporation; A. Scott Dowd, Paper Industry; William H. Theroux, Williams Gray Company; Barney Benson, Williams Gray Company; H. Starr, Brown Company.

Massachusetts: Stoneham—Victor Thomas, Paper Makers Chemical Corporation; Holyoke—John C. Cunningham, B. F. Perkins & Son.

Indiana: Kokomo—C. J. McMahon, Central Chemical Corporation.

Pennsylvania: Pittsburgh—F. D. McAllister, Diamond Alkali Company.

New Hampshire: Berlin—N. L. Nourse, Brown Company.

New York: Albany—H. E. Parkman, F. C. Huyck and Sons; Niagara Falls—C. E. Lyon, Hooker Electro Chemical; R. A. MacDonald, secretary of the Technical Association of the Pulp and Paper Industry and editor Technical Section PAPER TRADE JOURNAL; T. J. Burke, secretary of the Cost Association of the Paper Industry and editor of the Cost Section PAPER TRADE JOURNAL; Olin Callaghan, Edgar Brothers; W. J. Wead, Electro Bleaching Gas Company; W. E. Ihling, E. J. Keller and Company, all of New York City.

New Deckling Machine

The Lester & Wasley Company Inc., of Norwich, Conn., has recently developed a new deckling machine which should prove of great interest to paper manufacturers and paper converters. With this machine it is possible to furnish a sheet or card with a deckle on from one to four edges as desired. This feature of deckling four edges as against two heretofore possible, should create an increasing demand for this type of machine. Through its use the most beautiful effects are obtained by using a laid stock with colored center, for while deckling this, the center is exposed, giving a bordered effect to the deckled edge.

Trade Mark Department

CONDUCTED BY NATIONAL TRADE-MARK CO., WASHINGTON, D. C

The following are trade mark applications pertinent to the paper field pending in the United States Patent Office, which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade Mark Company, Barrister Bldg., Washington, D. C., trademark specialists. As an additional service feature to its readers, PAPER TRADE JOURNAL gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.

UNITY No. 207,972. Crd-Lect Company, Los Angeles, Cal. For bookkeeping ledgers, forms, letters, stationery used in bookkeeping.

LUNCHETTS No. 275,664. Beach & Arthur, Inc., Indianapolis, Ind. For paper napkins.

TEN HUNDRED WEDDING No. 279,817. M & F Schlosser Paper Corporation, New York City. For writing paper, correspondence cards, and envelopes.

SHASTA and representative of Mr. Shasta No. 275,800. The Shasta Water Company, San Francisco, Cal. For non-alcoholic, noncereal, maltless beverages sold as soft drinks, and water.

CHESBOARD No. 276,627. Tennessee Extract Corporation, Nashville, Tenn. For paper and paper board adapted for use in making the inner corrugated material and also the surface sheets or liners of corrugated board.

SERV-O-SEAT No. 279,234. Louis McCabe, Albany, N. Y. For toilet-seat covers made of paper.

AUTO-GRILL—No. 263,034. Carter-Strite Manufacturing Company, Minneapolis, Minn. For paper wrappers for bacon.

RELY ON EVERETT—No. 280,836. Everett Pulp and Paper Company, Everett, Wash. For permanently-bound blank books, printed billheads and statements, and printed forms.

FASTICK—No. 281,028. Wortendyke Mfg. Co., Richmond, Va. For gummed paper products of all kinds.

ROYAL MOUNTO—No. 281,044. Downingtown Paper Company, Downingtown, Pa. For paperboard.

SANIPURE—No. 281,424. Haas Brothers, San Francisco, Cal. For toilet paper, wrapping papers, particularly wax papers.

VARIBRITE—No. 281,656. Detroit Sulphite Pulp and Paper Company, Detroit, Mich. For bristol board, tissue and wrapping papers.

Expansion of Swiss Paper Industry

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 15, 1929.—The Swiss paper industry is engaged in the formation of a holding company which intends to further the construction of large paper mills abroad, the Department of Commerce learns from O. B. Moussman, Office of the Commercial Attache, Berne. One such paper mill has already been financed in Rouen, France, and whether or not this policy will end in curtailing Swiss exports of news print remains to be seen, but competent observers are of the opinion that no such danger exists.

During the year 1927 the paper industry suffered from a serious lack of outlets for its products. Foreign demand was chiefly for news print paper. In fact, of the twenty-eight different classifications on the Swiss paper export schedule, shipments of news print account for approximately 80 per cent. Imports of this class, on the other hand, are negligible. At the opening of 1928 a similar depression existed, nearly all of the mills working at less than full capacity. Later in the year, owing to a general improvement in other Swiss industries and an all-around favorable year, the domestic demand for paper increased and paper manufacturers expressed themselves as generally satisfied with the year's results.

The Swiss paper industry is well organized. Two cartels which have been formed with a view to protecting its interests as well as eliminating friction amongst manufacturers are the "Eika" (Einkaufsstelle des Schutzverbandes der papierverarbeitenden Industrie der Schweiz) and the "Verkausgenossenchaft Schweizerischer Pappenfabriken." The first which is a central buying for Swiss paper manufacturers, has a capital of 869,300 francs ($167,775) and a reserve fund of 100,000 francs ($19,300). According to the annual report of the above organization, all paper mills associated with it were satisfied with operations in 1928 and have decided to continue their former policy of turning all profits to reducing production costs and combating foreign competition. The second organization is a sales office for cardboard manufacturers.

On the whole, the Swiss paper industry concluded a generally satisfactory year at the end of 1928, with anticipations of gradual improvement for the current year.

To Make Pads at Cohoes

COHOES, N. Y., May 21, 1929.—The Color Check Company, of Brooklyn, manufacturers of order pads, restaurant tickets and other such products, has taken a lease of a large factory building in this city where the firm plans to carry on its business in the near future. It was stated by an official of the concern that operations will be under way within about two weeks. Equipment is now being installed and it will require several days to complete this work. The plant will have a capacity of 6,000 gross of pads a day while this output will be increased and the plant expanded as the demand requires. It was stated by Nicholas Hirsch, an official of the firm, that another company of the same type as he represented would probably follow example and locate in this city in the near future if satisfactory arrangements can be made. Mr. Hirsch said that all raw materials used by his concern would be purchased from the Mohawk Paper Makers Corporation in this city. The efforts to bring the firm here were completed by members of the local Chamber of Commerce and officials of the Mohawk Paper Makers Corporation. About 75 persons will be given steady employment at the start and this number will be increased as the business warrants.

Brotherhood Counts Vote

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., May 21, 1929.—For the past week the board of canvassers of the International Brotherhood of Papermakers has been busily engaged counting the vote cast in the recent referendum of the organization. The officials engaged in the work include Michael J. McLain, of Holyoke, William Bilson, of Niagara Falls, and Thomas Moran, of Troy. The work will probably consume several days as the balloting has been heavier than usual. The board will then make its report to the executive board and the results of the election will also be sent to all locals in the United States and Canada. David Larner, of North Tonawanda, is also in this city making his semi-annual audit of the books of the International organization. President William R. Smith is still in the West in conference with paper manufacturing concerns in connection with the new wage and working agreements. Conferences are scheduled next week with the Advance Bag and Papr Company, of Howland, Me., and the Lincoln Pulp and Paper Company, of Merritton, Ont.

Catalogue of Johnson Friction Clutches

The Carlyle Johnson Machine Company, Manchester, Conn., has just issued a new loose leaf catalogue showing various sizes and types of the Johnson Friction Clutches. This catalogue is composed of loose leaf pages showing the application of the company's clutches in various industrial fields and also includes reprints of its advertisements covering various industries.

A special feature of the catalogue is the assembling of pages showing the application of the company's clutches to different machines in each particular industry. One of these is devoted exclusively to the pulp and paper industries. The catalogue is so arranged that one can readily visualize the various uses of these friction clutches and their mechanical features. These catalogues are obtainable for the asking.

Developing Northern New York

[FROM OUR REGULAR CORRESPONDENT]

MALONE, N. Y., May 20, 1929.—Several hundred representative business and industrial leaders from St. Lawrence, Franklin, Jefferson, Oswego and Lewis counties this week attended the annual meeting of the Northern New York Development Association at which the principal address was given by Floyd L. Carlisle, president of the St. Regis Paper Company. He stressed the need for development of a community consciousness in Northern New York in giving the section the right to take full advantages of its natural resources pointing out the prosperity that would consequently follow. Mr. Carlisle opened his address by saying that he had been waiting nearly two years to deliver the message that was in his mind. The speech in part follows:

Rich Natural Resources

"Only the other day I received a letter from Kansas City inviting the St. Regis Paper Company to locate a branch in that city. The letter went into detail concerning the advantages of Kansas City as a location for industry. Outstanding among the advantages enumerated was the fact that ten million people lived within the trading area of Kansas City. There flashed through my mind the contrast between this market of ten million people and the thirty millions who live within the trading area of which Northern New York is the center. Kansas City has not natural resources, in fact it has nothing in comparison with what this section possesses. Yet Kansas City is going out into the world for new industries and I wonder why there is no progressive spirit like this in the North Country.

Decrease in Number of Wage Earners

"The story of the decrease in the number of wage earners and of sales opportunity provides one of the answers. There are fifty per cent less wage earners in New York than there were eight years ago. Why? Eight years ago we thought we were going to be permitted to develop a swamp on the Salmon River into a reservoir. It had been done on the Beaver River and we had deflnite plans for the creation of the Titusville Reservoir which would help to stop the intolerable waste of power on the Salmon River. The river is capable of developing 120 million kilowatts of power. Lacking the regulation which a reservoir would permit only fifteen million of this potential power has been developed. The electricity that full development of the river would permit would supply all of the lighting power that could be used in a city of 200,000 population. The principal reason why Malone and Franklin counties are selling 40 per cent less of products and employing 50 per cent less of wage earners than they did eight years ago is because the laws of New York State will not permit the utilization of this power. Until the Salmon River can turn out firm power there can be no permanent development in this section. There is no other place in the country where storage reservoirs are opposed. The industrial expansion of the South has resulted directly from the building of reservoirs. California, Montana, Minnesota Wisconsin and Canada have all solved the problem but New York lags behind and unless the situation that now exists can be remedied there is no improvement in sight. The same problem on the Racquette, Oswegatchie and other rivers of the North Country.

Potential Power

"Wherever there is power there is industrial development and right in this vicinity there is more potential power than at Niagara Falls. All that prevents an era of prosperity in the North Country is the development of the firm power that storage reservoirs will make possible. Opponents of storage reservoirs in New York assert that the state would not under present conditions receive a sufficient revenue. The land for instance which would be taken for the Titusville reservoir is not worth a dollar an acre. Why should the state receive any vast revenue for such useless land? If the state took all of the income that some people the Titusville reservoir should pay the power produced could not be sold cheaply enough to attract industries.

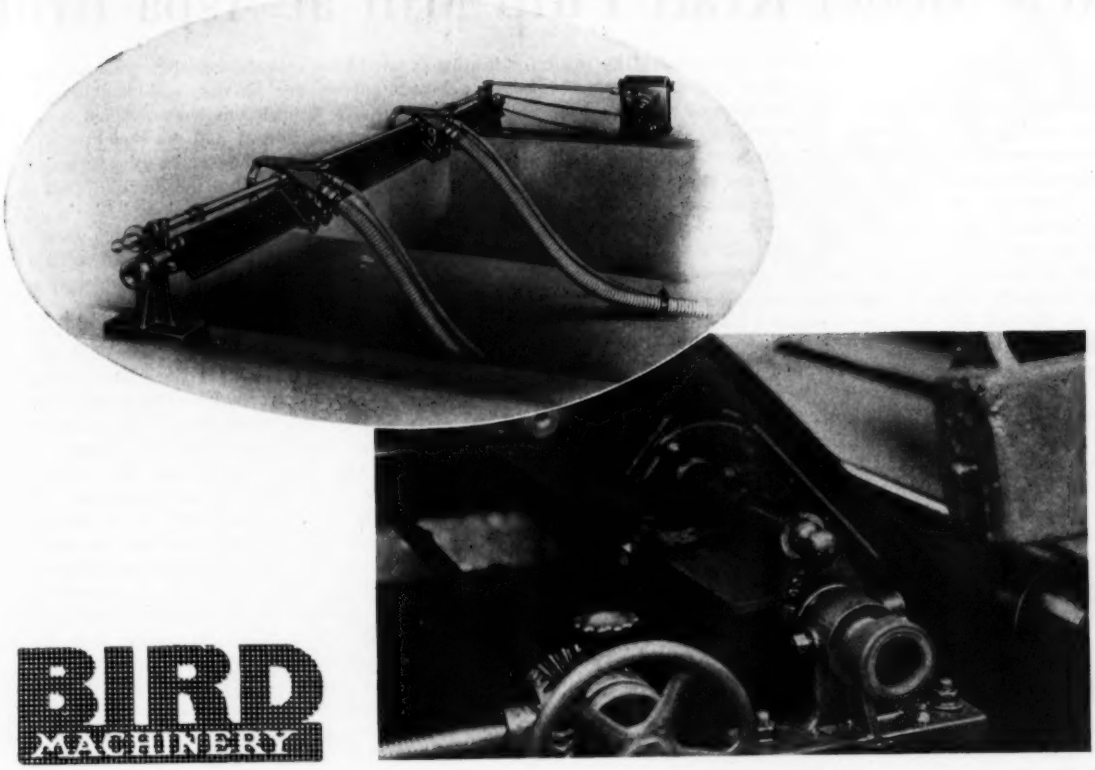
"The question of revenue from storage reservoirs has never received consideration anywhere else. There is no question that we can get industries if we can get firm power and produce it at a price so cheap that manufacturers will come here as a matter of business. We do not want any special favors in the matter but simply an even break with the rest of the United States. One of the reasons why we have failed to win the right to use our natural resources is our lack of a live Northern New York community consciousness. Local jealousies have prevented this consciousness but if we can develop and arouse the spirit of our people nothing can stop us from getting what the rest country has obtained. Why not ask for our rights?

The Matter of Timber

"Another matter in which the people who live in the foothills of the Adirondacks are vitally interested is that of timber. The business of paper making grew up in Northern New York because of the timber supply but Northern New York is in danger of losing its paper industries to Canada. Within the Adirondack preserves there are two mollion acres of land covered with second growth timber, all of which is locked up forever by a provision in the state constitution. In Germany, Norway and Sweden a half a cord of wood per acre is taken off annually and the forests of those countries are the better for this intelligent lumbering. The State of New York could get a revnue of millions of dollars a year by cutting the mature timber that is going to decay in the forest preserves. This is the only place on the face of the earth where mature timber is thus locked up through the efforts of a few wealthy New Yorkers who own private preserves within the state park and who on their own land do just what they refuse to permit on state land. There men chuckle to themselves at the stupidity of Northern New Yorkers in permitting this to go on. I have great pride in Northern New York, I have confidence in its people, and I believe there are enough fighting people here to say they are not going to g down to defeat in this respect.

Power Running To Waste

"Another thing responsible for the decadence of Northern New York is our failure to develop the power that is running to waste in the St. Lawrence River. For 20 years every effort to develop this power has failed. If it were developed Northern New York would be one of the greatest industrial centers in the country. Yet with the knowledge of what St. Lawrence development would mean to this great section Northern New York has stood still and silent, divided among ourselves, and has given no aid to those who have sought to harness the great river. We may not live long enough to see the river harnessed unless we develop that community consciousness to which I have referred. We are standing with our backs to the wall fighting for our very existence while other sections of the country are going forward. Last year was the most prosperous one in the history of the United States but the tidal wave of prosperity missed Northern New York because we have not that community consciousness which would have allowed us to demand our rights. We were beaten before we started. If we can divorce our problems from policies we can get anything we want. Within 50 miles of this place there is more power than anywhere else on earth. Are we going to take advantage of it or stand still in the future as we have in the past? Let us get together and fight for that which is ours by every right."



BIRD MACHINERY

The average production per felt per year on ten paper machines increased sixty per cent after the mill put in Vickery Felt Conditioners.

Let us show you what the Vickery Felt Conditioner can do on your machines.

BIRD MACHINE COMPANY
South Walpole
Massachusetts

2315

The Vickery Felt Conditioner

New Model Kraft Pulp Mill at Aspa Bruk

The new pulp mill at Aspa Bruk, owned and operated by the Munksjo Aktie Bolag, Incorporated, of which August Skeppstedt is president and general manager, has been planned with the intention of making the enterprise as self-operating, self-sustaining and self-perpetuating as possible. This is the latest kraft pulp mill in Sweden and of course all its equipment is the most modern obtainable. Although the mill has been operating for but eight months, its kraft pulps for both paper and board are already favorably known in the U. S. A. The American sales agents are Parsons & Whittemore, Inc., 10 East 40th street, New York.

Timber is partly obtained from the company's own land and brought to the mill site over the Company's own railroad, clear water is supplied by the lake Vettern, and power is furnished by the company's own power plant. The mill itself houses entirely modern and durable mechanical and electrical equipment. Electric operation predominates throughout, and as nearly as possible all processes have been made automatic.

The pulp manufactured is that technically known as kraft. The alkaline sulphate process patented by Dahl in 1884 differed from the soda process in replacing the loss of soda by sodium sulphate instead of by soda ash or caustic soda. Pulp made by the kraft process differs from that made by the soda process, in that the stock is only partly cooked and its disintegration completed by grinding in refiners and the resulting paper although darker in color, is softer and more pliable and stronger and tougher in texture. It is also cheaper because less weight is required for strength and because of this milder treatment in the cooking process.

In the forest the trees are cut and split into twelve-foot blocks from three to 8½ inches in diameter and loaded on block trains. On arrival at the mill the blocks are unloaded from the cars alongside chain conveyors upon which they are thrown as needed and carried to the knife barkers, where the bark is removed. The block carries from the opposite end of the barker upon another conveyor to a chipper. The chips are screened, pieces larger than one inch being separated and put through a crusher and the dust and small refuse being carried away by a refuse conveyor. From the screen the chips are elevated to the chip bins, directly over the digesters. Chips from the bin are dropped through a chute into a digester, and white liquor, containing as active agents sodium hydroxide and sodium sulfide added. There are several ways by which the chips and white liquor may be heated in a digester. By the indirect heating method, which is in use here, a pump is used for the circulating, but the steam for heating is not blown into the digester. Instead, the steam is led to a heater outside the digester, and the circulating liquor from the pump passes through this heater, which is so designed that the steam is on one side of and the liquor is on the other side of a series of tubes. The condensed steam is fed back to the boilers instead of going into the digester, thus the liquor that returns to the digester is not weakened by the addition of condensed steam. Among other advantages with this method of cooking are saving of salt cake and time, production of a stronger fiber, and a saving of wood on account of the better circulation obtained.

After cooking, the digester charge is blown into a wash tank or diffuser, where the dissolved incrusting matter and spent chemicals are washed out, leaving only the fiber; the strong liquor is first drained off to the storage tanks. The contents of the diffuser are then washed by a counterflow of progressively cleaner liquor than has been used in washing the contents of another diffuser until the hydrometer shows that the strength of the liquor is too low to justify the cost of evaporation. The washing of the charge is then continued until it is considered clean, and the final resulting liquor is discharged into the sewer.

Following for a moment the course of the spent liquor from the storage tanks, it is allowed to flow into a vacuum evaporator, thence to the disc evaporators. In the latter discs on horizontal shafts revolve slowly in the liquor, hot gases from the incinerating furnaces passing between the upper exposed portions of the discs and adheres to the discs. The concentrated liquor is then admitted to the rotary incinerators and dried out or calcined, emerging in the form of black ash or impure sodium carbonate. The greater part of the evaporation takes place in the rear part, where the liquor is fed from a pipe. As the liquor advances toward the heated part it catches fire and on emerging is discharged into the melting furnace, where its complete combustion is provided for by forced drafts from a blower. In the smelter, salt cake or sodium sulphate is added to replace the soda lost in the recovery process, all the organic matter is burnt out, and the purified sodium carbonate flows in a red hot molten state into water or weak washings in the dissolving tanks, forming green liquor, a solution of mixed sodium salts. When sufficient in strength for causticising, the green liquor is pumped to the causticising tanks and titrated to ascertain its alkaline strength. As much burnt lime as is necessary for the purpose of causticisation is added and allowed to settle. The clear liquor from the top

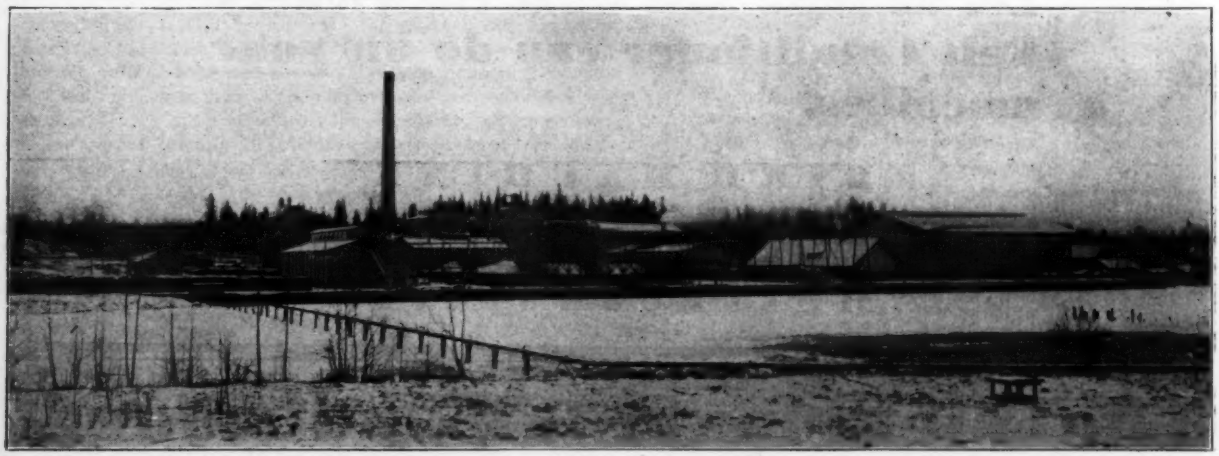


FIG. 1
General view of the plant.

DOWNINGTON
KILBERRY PATENT SUCTION ROLL

Downingtown Introduced

Outside Angular Adjustment of Box

IN the Kilberry Patent Suction Roll, Downingtown introduced a means of changing the angular position of suction box while the machine is running. Aside from eliminating the expense of a shut-down, this outside adjusting device enables the machine tender to instantly observe the effect of the adjustment, without guesswork.

This is only one of the many important suction roll improvements, which must be credited to Downingtown.

Installations in mills making many kinds of paper indicate that the Downingtown Roll meets every requirement of the industry, and as new problems arise we are prepared to solve them. Literature and a copy of our favorable Suction Roll Decision from the U. S. Court of Appeals sent on request. *Downingtown Mfg. Co., Downingtown, Pa.*

36—5-23—P.T.J.—5-9.

of the causticising tank overflows to the storage tank for digester liquor, while the thick mud in the bottom is pumped through a continuous filter, which allows the clear liquor to pass through, the lime sludge remaining behind, where it is washed free from caustic.

Returning to the washed fiber in the diffuser, after the washing process, the pulp is discharged into the diffuser chest. From this it is pumped into a head box and passes through a knotter of the revolving screen plate type to the flow box, and thence flows on the wire of a modern wet machine equipped with a shredder device. By the shredder the pulp is torn off in small irregularly shaped pieces and discharged in the front of the machine into a hopper leading to a number of edge runners. From the edge runners the stock is discharged into a large chest and pumped into the screen head box. The fibers that are too course are screened out, the rest goes to the pulp thickeners, thence by growth to the machine chest, is pumped to the machine head box and thence flows on the wire.

The pulp drying machine is a 130-inch Fourdrinier machine, built by the Aktiebolaget Karlstads Mekamiska of Karlstad, Sweden. The Fourdrinier wire is 128 inches wide and 50 feet long. The breast roll is 15 inches in diameter and has a 130-inch face. The shell or body of this roll is of cast gun metal, bored on the inside and turned or ground on the outside. The couch roll is 24 inches in diameter. The table rolls are 4½ inches in diameter and are made of seamless drawn brass tubing, with cast iron heads and steel journals carried in brass bearings. The return wire rolls vary in diameter from 6½ inches to 8 inches. The rubber deckle straps are 3 inches square. There are three suction boxes one of the revolving type. There are also three presses of polished cast iron with the upper press rolls controlled by journals running in bell crank arms of heavy press housings. These housings contain screws, worm gears and hand wheels by which the upper rolls may be lifted when changing felts. The felts are of pure wood 48 feet long.

There are 24 driers each 50 inches in diameter and of 160 inches face arranged in two tiers. These driers are accurately turned, balanced and polished on the face. Steam of low pressure is introduced into each drier through a special joint in the rear bearing and from which is removed the water formed by the condensation of the steam by means of a siphon.

As the dry pulp is to be shipped in bales, it must be cut into sheets. This is accomplished by cutting the continuous web of pulp into strips of the desired width and then cutting the strips into sheets of the desired length. Before cutting, the pulp must be perforated, i.e., "damaged" to prevent its use for printing purposes. This is done by passing the pulp web over a roll having spikes on its surface. The sheets from the cutter fall into a stand, where the winder boy picks them up and places them on the truck, which is on a scale. The scale is placed close to the cutter and a truck that will run into the baling press is placed on the scale. On the bottom of this truck, there is an iron plate fastened, and so cut as to facilitate the passing of the bale ties under the sheet. A similar plate is also placed on the top of the hydraulic press. Wrappers of the same quality as the dry pulp in the bales, are placed on the bottom of this truck and also on the top of the weighed bale. The loaded pulp truck is now run into the press, the operating valve opened and the baling wires are run around the bales. When the pressure has reached its

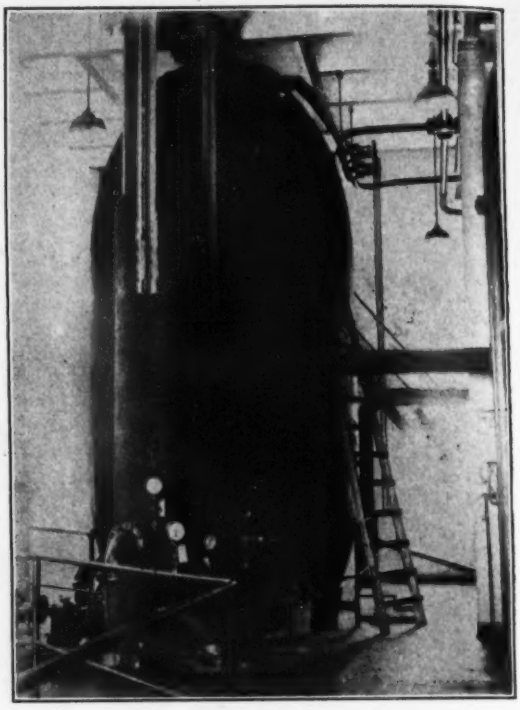


FIG. 4

Digester room. Stationary kraft digester showing indirect system of cooking. (Centrifugal circulating pump handling 750 gallons a minute.)

FIG. 2

Wood room showing the log conveyor, a 112-inch chipper and bark separator.

FIG. 3

Wood room showing chip screen and an 88-inch chipper. (Chipped slabs sent to boiler house for fuel.)

What users say of the ---

TERRY
Paper Machine Drive -

"Terry turbines giving entire satisfaction." From one mill superintendent to another.

"The turbines are behaving splendidly and we are all well satisfied. From a mill that has just installed its third Terry drive.

"All of the Terry turbines we have installed have worked out exceedingly well and we are very much pleased." Says a builder of paper machines.

"It is a good arrangement. On machines that we have built it has worked out very satisfactorily." From a builder of paper machines.

"I want to tell you that our turbine is the most satisfactory of any which the writer has come in contact with." -- Writes a user of two 450 HP Terry drives.

"Again I want to tell you that our turbine installation is the most satisfactory of any which the writer has come in contact with." -- Writes a user of two 450 HP Terry drives.

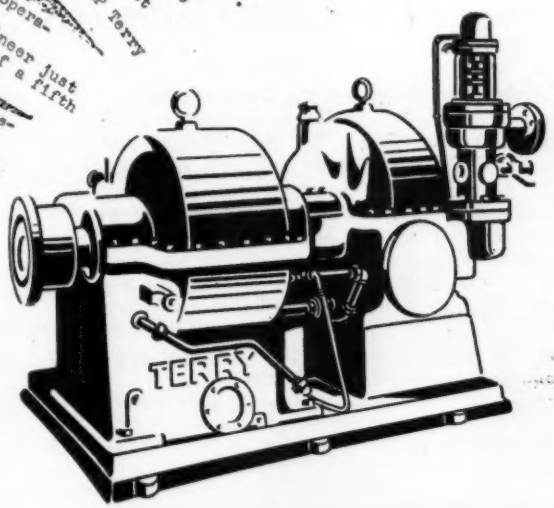
"We are more than satisfied with the operation of the entire unit." Comment of a chief engineer just after the installation of a fifth Terry drive in his mill.

"We are running four Terry turbines on newsprint machines, and one on wrapping. Are working very satisfactorily." -- Writes the superintendent of a mill where Terry drives have been used for over 12 years.

"We have your favor of the 16th regarding the variable speed turbine for paper machine drive and in reply the writer is pleased to state that he has had excellent results with the Terry turbine." From one mill superintendent to another.

"We are obtaining excellent results with the turbine. We are getting ready to install another drive at the present time." From a mid-western mill that installed its first Terry paper machine drive on trial.

"We are highly pleased with the performance of the Terry Steam Turbine which we use for driving our 160" paper machine. The speed control is perfect at all speeds of the machine. Should we put up another paper machine, we would again install the Terry turbine." From a mill superintendent who has been operating a Terry drive for four years.



The Terry Paper Machine Drive is built in all sizes from 30 H.P. to 900 H.P.—for variable speed or constant speed—for high speeds or low speeds—for belt drive or direct connection—for all steam pressures and back pressures. Write for complete information. Cooperative service of our engineers is at your disposal.

The Terry Steam Turbine Company

TERRY SQUARE, HARTFORD, CONN.
OFFICES IN PRINCIPAL CITIES

Steam Turbines · Gears · Shaft Couplings

T-1035

highest point, the wires are fastened together and the pressure is then released. A shipping truck terminates in the machine room, where the bales are loaded into cars.

The boiler room is equipped with modern water tube boilers with soot blowers, superheaters and stokers. The stack is of radial brick, varying from 18 to 9 feet inside diameter, from the bottom to the top, and is 200 feet high.

The power plant generating equipment consists of two turbo-generators developing a total of about 625 k.w. and are manufactured by the Svenska Turbinfabriks—Aktiebolaget Ljungstrom of Finspong, Sweden.

Exhaust steam, up to 25 pounds in pressure, and of sufficient quantity to dry the pulp, and serve all other low pressure steam requirements is extracted from the bleeder type turbine, which regulates the pressure at the desired value.

Work on the construction of the mill was begun in July 1927 and the first dry pulp was made August 28, 1928.

The payroll of the mill will include 90 employees. The output capacity is 15,000 tons a year.

The mill was designed and erected by Otto Heijne, who is now in charge of the mill in the capacity of mill manager. Mr. Heijne is at the present time visiting the consumers of kraft pulp in this country, for the purpose of familiarizing himself with their individual requirements.

The sales of the kraft pulp from the Aspa mill are exclusively handled by Parsons & Whittemore, Inc., 10 East 40th street, New York City, who will gladly furnish samples and quotations upon request.

Combustion Engineering Corp. Exhibit

The principal feature of the Combustion Engineering exhibit in Booths 572 to 580 at the N. E. L. A. Convention, Atlantic City, June 3 to 7, will be super-station type, C-E Multiple Retort Stoker.

This exhibit will be one of the largest of its kind ever installed. The platform and steel structure supporting the stoker will cover practically the entire area of the space, 50 feet long by 16 feet deep. The two-roll clinker grinder pit will be over 8 feet in depth. All moving parts of the stoker and clinker grinder will be in operation.

A grating platform will surround the stoker and will permit close inspection of every part of the exhibit.

An interesting feature will be a separate exhibit of one of the new multiple retort stoker gear boxes, the casing of which will contain glass doors to permit observation of the interior design and workmanship.

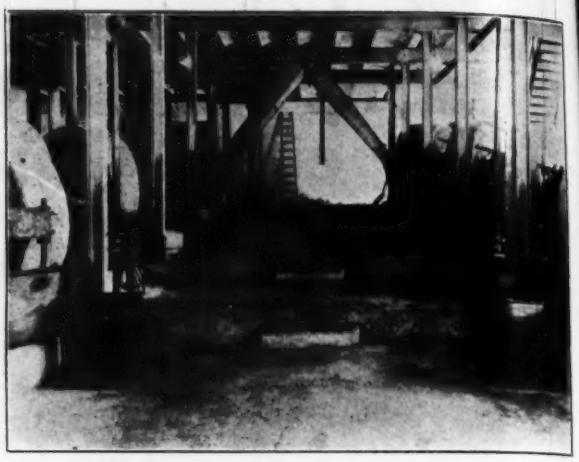


FIG. 6

Pulp refiner room showing edge runners for refining pulp.

The C-E Multiple Retort Stoker embodies many new features of design and construction, which it is believed will make this exhibit of particular interest to operating engineers and executives of public utility plants.

In addition to the multiple retort stoker, sections of C-E forged steel, sectional header boilers will be shown, and models of the C-E Fin Furnace (Water-cooled) and the C-E Air Preheater. There will also be enlarged drawings showing outstanding installations of various types of C-E boilers, stokers and pulverized fuel burning equipment.

Duebener's Shopping Bag Incorporates

INDIANAPOLIS, Ind., May 21, 1929.—Articles of incorporation have been filed with the secretary of State of Indiana by Duebener's Shopping Bag, Inc., of Indianapolis. The corporation has an initial capital stock of 25,000 shares of no par value common and $250,000 preferred. It is formed to manufacture and sell and distribute paper, paper shopping bags, cloth specialties and all articles made or manufactured of paper cardboard, wood and other bags. The incorporators are Walter H. Duebener, Lydia Duebener, R. F. Geddes, Herman W. Kothe and Greer M. Shotwell.

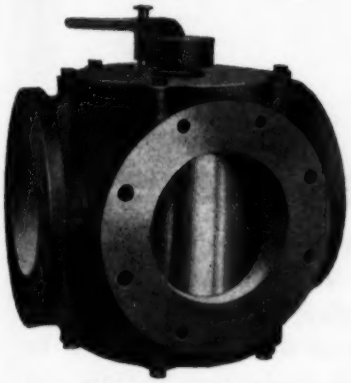
FIG. 5

Recovery room showing incinerators and waste heat boilers.

FIG. 7

Machine room showing 130-inch Karlstad dryer machine and car for handling baled pulp.

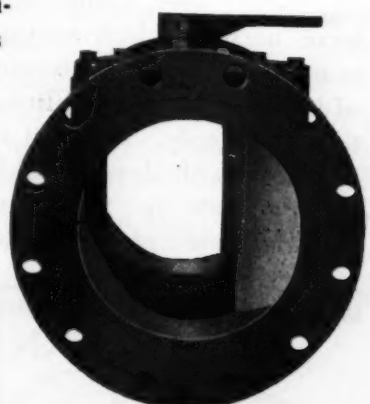
Over 100 Mills *have proven the performance of* Valley Plug Valves-



Valley 3-way valves are popular where stock must be turned from one line to another.

THEY have found that Valley Plug Valves fill all the needs for stock line conditions. Made simple—without any unnecessary parts to wear or get out of order, so that the operation cost is practically nothing—Valley Plug Valves are the result of long engineering experience. Built in two and three-way types—in sizes from 2" to 20", these valves are always carried in stock for immediate shipment. Mills have found this an additional service that helps them. They get valves when the valves are needed—without manufacturing delays.

Write for complete information—and let us give you the benefit of our engineering experience. It's a dollars and cents proposition for your mill.



Quick opening—designed simple but rigidly built for long service—the popular 2-way valve.

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

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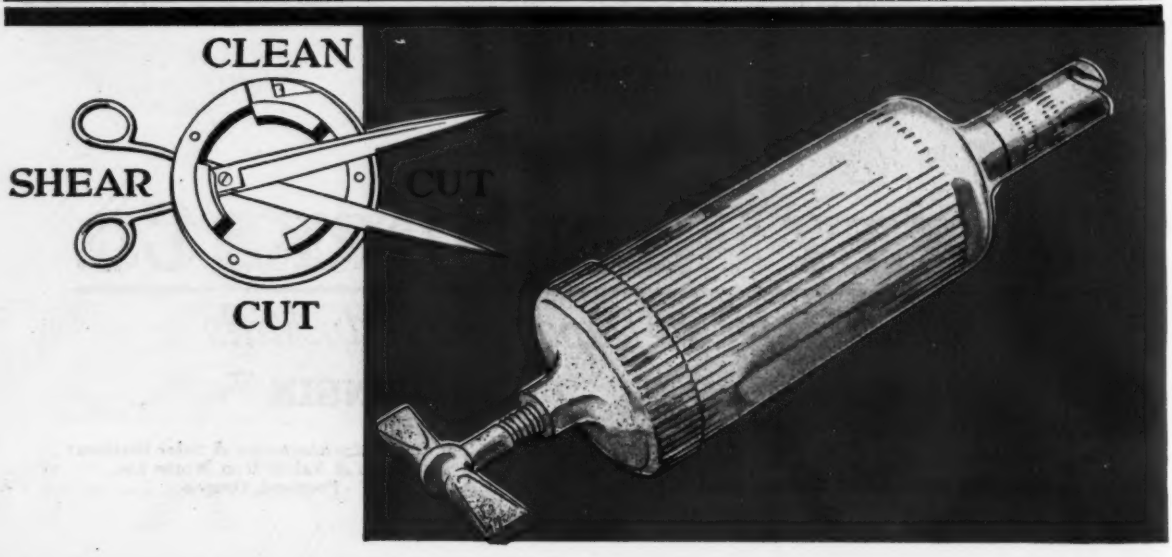
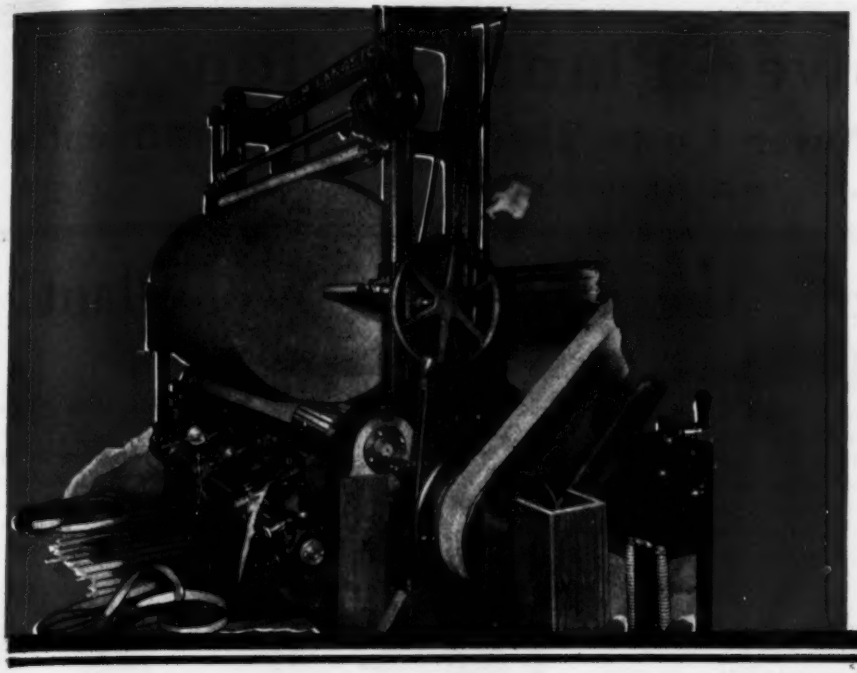
LANGSTON
Easy, Economical LUBRICATION

FROM the H. F. Watson Company plant at Erie, Pa., comes another *fact record* of Langston Slitter and Winder efficiency. This plant, making felt and asbestos papers, operates twenty-four hours a day, 300 days a year. At no time has production been delayed by slitting or winding trouble. In fact, Langston Slitters and Winders have helped increase production and have accomplished savings of over $6000 per year! Now there is a very definite reason for Langston economy of production and operation. Here it is: In thirty years of building Langston Slitters we have always made them to *operate* cheaply, instead of to *sell* cheaply. Prove it to yourself. Check Langston's features of design and construction with those machines built to sell at a price: heavy, rugged construction from the bed-plate up; refinements in detail of design; improved two-drum and rider roll winding principle; the famous Shear-Cut—a clean, positive cut, making even-edged,





dust-free rolls; generous use of material where weight and strength are essential; balanced, smooth-running machine; *chrome nickel, heat-treated steel gears;* easy, economical lubrication, made fully effective through the use of *roller and ball bearings.* These bearings determine the productive life of your Slitter. Langston uses roller and ball bearings because they slow down depreciation and reduce power losses. They save lost labor-hours; reduce "out-of-service" time for repairs; give you greater production and general plant efficiency. At the Watson plant, for instance, Langston equipment saves 100 labor-hours a year, formerly required for repair and maintenance on another make of slitter. Consider all these things carefully—then you will buy Langston Slitters because they help lower production costs and improve the quality of your product. Our Engineering Staff is at your service. May we send you a catalog?

SAMUEL M. LANGSTON COMPANY, CAMDEN, NEW JERSEY

LANGSTON SLITTERS

Power Plant Section

Reducing Power Costs Through Unit Treatment

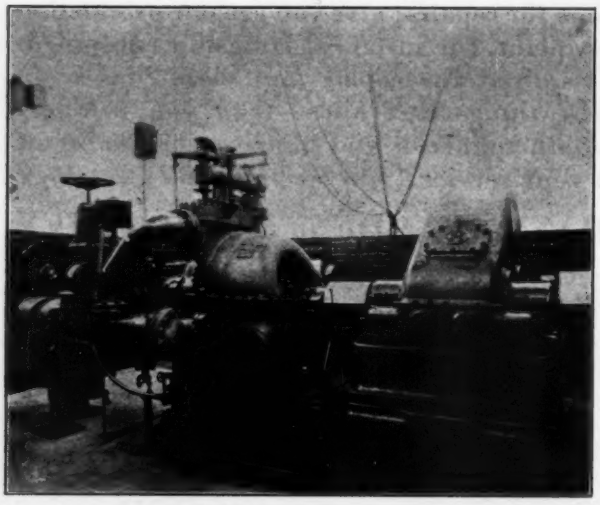
Conducted by REGINALD TRAUTSCHOLD, Consulting Engineer

Modernizing the Mill and Power Plant

Steam Turbines and Higher Steam Pressure

With literally scores of paper mills turning to high pressure steam operation, perconceived ideas of the requirements for an economical paper mill power plant are very rapidly being discarded. The trend today, as is quite general in the power field, is to adopt higher and higher operating steam pressures and thereby secure better efficiencies. In fact, it is reported on good authority that at the present time there are twenty-seven or more mills in th United States and Canada which have decided to employ steam generated at pressures ranging from 400 to 650 pounds per square inch. This range, moreover, far from establishes a record, for much higher steam pressures are even now being employed in a number of pulp and paper mill plants. The installation of 1,000 pound steam boilers at the Masonite Corporation, Laurel, Miss., for instance, is a striking example of this decided trend toward operation at higher and higher steam pressures.

This quite general movement is the result largely of developments in the steam turbine field, for when these high pressures are employed it is almost imperative that steam turbines be employed for power generation as well as for auxiliary drive. It necessitates, of course, that the steam used in the turbine before it passes to the digester line or to the heaters, but this presents no obstable to the use of the modern bleeder and back pressure turbines, nor under certain conditions to the use of single stage turbines. For that matter, all the four recognized types of steam turbines, condensing, non-condensing, extraction and multi-extraction, are suitable under certain conditions, and are extensively used, for paper mill operations. The particular needs of the mill should govern.

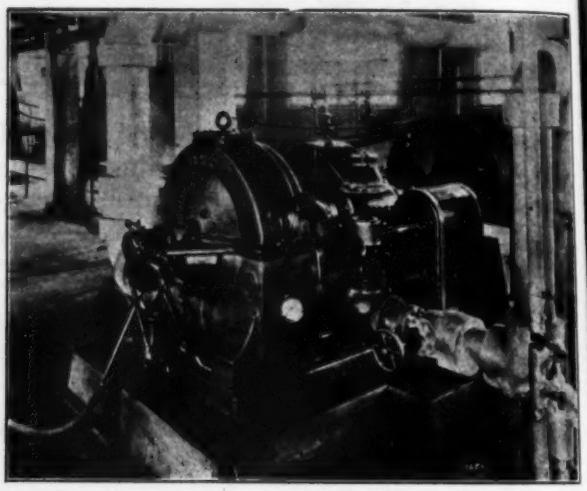


Courtesy: Terry Steam Turbine Co.

FIG. 1

350-hp. single stage turbine in paper mill service.

The question of the proper type to employ hinges in large part on what is necessary for securing a satisfactory heat balance, giving due heed to simplicity of construction and operation, cost and space requirements. If proper study is given to these matters, it will be found that the fitting of the turbine to the mill conditions



Courtesy: General Electric Co.

FIG. 2

475-hp. impulse type turbine and reduction gear. St. Croix Paper Co., Woodland, Me.

entails far less upheaval of established operating methods and practices than might be supposed. Each installation presents a more or less individual problem, however, precluding the advancement of any general recommendations as typifying approved practices in respect to type of turbine equipment or in regard to high pressure operation. The most useful discussion of steam turbine applications in pulp and paper mill plants, consequently will be one consisting of brief descriptive notes of some individual installations which conform to the requirements for low power and steam costs, in which various types of steam turbines are employed. Before engaging in such a discussion, however, it might be well to point out what are some of the economic advantages of employing bleeder and back pressure turbines for developing by-product power, since unquestionably there is a very decided movement toward the more general use of higher steam pressures and of the more complicated types of rotary power units.

The fundamental reason for generating steam at high pressure and making use of it for power generation before it is made use of in thermal process operations is, of course, that by the addition of only a relatively small percentage of heat in excess of

Frankly-

what *are* your lubrication costs per ton?

Some paper mills are running at a cost as low as 6 cents per ton of finished product. Others as high as 80 cents per ton. Every mill is an individual problem. No two are alike—yet for every one there is a low figure and anything above this represents money thrown away. What are *your* costs—

Texaco Lubrication Service is thorough, systematic and competent—a service of specialists—lubricating engineers who have given years to the study of paper mill lubrication. The line of Texaco Lubricants is complete. It is the work of Texaco Engineers to select exactly the lubricant required for every part of every machine and show you exactly how to use it—to save money for you.

This service has saved much for others. What will it save for you? There is a Texaco representative nearby who will gladly make a survey of your plant.

TEXACO LUBRICANTS

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THERE IS A TEXACO LUBRICANT FOR EVERY PURPOSE

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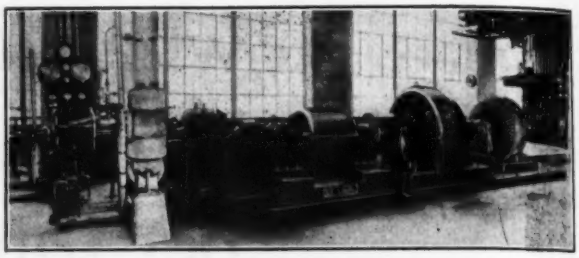
that required for heating operations a quite considerable amount of power may be obtained in advance of caring for heating requirements, despite the bleeding to the process line in the case of an extraction type turbine and exhausting at relatively high back pressure. As much heat may remain in the steam bled to the process and be available, consequently, for thermal processes as though the steam were obtained from low pressure boilers. When the power is developed by superheated steam exhaust at a back pressure, the heat of vaporization, the latent heat of steam, is not lost as in condensing operation, but is used in the process work. An analogous situation pertains, naturally, when the steam is bled for process operations from some intermediate stage of an extraction type turbine.

Superheat plays its part and the question of most suitable heat balance, as a result, becomes somewhat more complicated. To illustrate, a unit of 50,000 pounds of steam an hour may be assumed and investigated as to characteristics when expanded to digester and heater, or exhaust, pressures. If the initial pressure is 300 pounds gauge and the steam carries 100 degrees of superheat, it will at a digester pressure of 100 pounds still retain about 40 degrees of superheat, developing power in its expansion amounting to something like 875 kilowatts. The amount of superheat retained at 100 pound exhaust, 40 degrees, would insure practically dry and saturated steam in the digester. If the initial steam pressure should be 400 pounds, also carrying 100 degrees of superheat, the exhaust at 100 pounds would retain only about 21 degrees of superheat. The amount of power developed in the expansion of the steam, however, would be about 1,190 kilowatts. With 150 degrees of superheat, in either case, the superheat remaining in the exhaust at 100 pounds would be in the neighborhood of 40 degrees higher.

As superheat actually present in the digester is objectionable there is a limit to which superheat should be added to the steam at any given pressure. At ordinary pressures, superheat higher than 150 degrees is seldom used, although if the line to the digester is long i.e., presents considerable surface, superheat of considerably higher value may be advisable, as in the case, of course, where higher initial steam pressures pertain.

Considering the same steam supply at similar boiler pressures would carry about 27 degrees superheat and some 2,000 kilowatt by-product power would be developed during the steam expansion. In this latter instance, exhaust at 100 pounds would retain in excess of 100 degrees superheat. This, in many instances, would be too much for satisfactory digester service and would have to be utilized in some other way.

It is obvious, therefore, that when the boiler pressure is chosen simply so as to provide dry steam at the digester, wet steam will



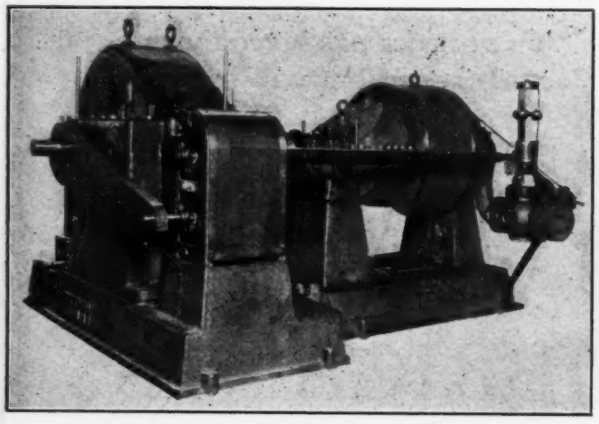
Courtesy: De Laval Steam Turbine Co.

FIG. 4

Refitted geared multi-stage turbine installation. Crown Willamette Paper Co., West Linn, Ore.

nearly always result in the heating lines. This, however, is ordinarily preferable to overheating the steam for digester operation by raising the initial steam superheat to such point as to insure dry steam in the heating lines. The moisture separating in the heating lines can be removed in large part by steam traps, even though some little entrained water may be carried over to the heating and drying units. Also, the higher the initial pressure of the steam with a given degree of superheat, the smaller is the amount of extra heat retained by the steam after expansion to digester and heating line pressures and greater is the amount of by-product power developed in the expansion to given extraction and exhaust pressures.

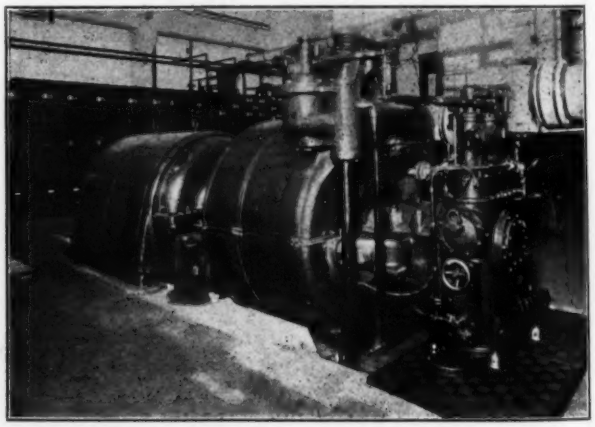
This little light thrown upon the complexity of establishing the proper heat balance to insure low power and steam costs is not intended as an exposition of the problems entailed, but rather



Courtesy: Terry Steam Turbine Co.

FIG. 3

350-hp. multi-stage turbine in paper mill service.



Courtesy: General Electric Co.

FIG. 5

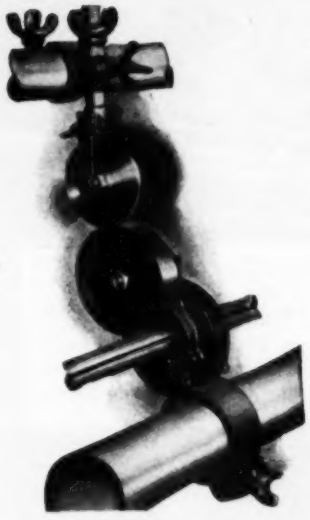
1,000-kw. non-condensing steam turbine. Warren Mfg. Co., Milford, N. J.

and with like superheat expanded to a heater, or exhaust, pressure of 20 pounds, other highly pertinent considerations become aparent. With steam at 300 pounds carrying 100 degrees of superheat, 1,725 kilowatts can be developed in its expansion to 20 pound pressure, but the resulting exhaust will be only about 98.4 per cent, dry and saturated. At 400 pounds and 100 degrees superheat, about 2,000 kilowatts would be developed in the expansion to 20 pounds and the quality of the exhaust would be about 97.2 per cent. dry. Going a step further and increasing the superheat of 400 pound steam to 200 degrees, the exhaust at 20 pounds as some indication of the care which should be exercised in fitting the turbine installation to the individual mill conditions, both as regards type of turbine and in respect to steam characteristics. Each installation is in reality an individual problem to be solved not by set rules and standardized procedure, but only after an economical and suitable heat balance has been determined and all influencing factors have been most carefully weighed.

It would seem advisable, consequently, to devote the balance of the present discussion to brief descriptive notes regarding specific turbine installations in which the all embracing and governing con-

"M. & W." Removable Bottom Slitters

Especially designed for wide and fast-running paper machine drum winders



THE GREATEST TIME-SAVING DEVICE FOR WINDERS IN RECENT YEARS

New and Desirable Features

1 Bottom slitters supported by arms from a stationary bar exactly the same as the top slitters, and are independent and removable—and all driven independently from a small, slow-running shaft.

2 The troublesome high speed, large diameter bottom slitter shaft is dispensed with, and a smaller diameter shaft used, running one-third the speed, and in ball bearings in slitter arms.

3 Slitters are adjusted to width of sheet—same as the top slitters.

4 Disc slitters or double edge band slitters may be used, and are carried on small spindles on ball bearings.

5 The wear of slitters caused by the vibration of the heavy slitter shaft eliminated.

6 A bad cutting bottom slitter is more likely to be replaced by a good one and a clean edge made—Removing and resetting all slitters being unnecessary.

7 Labor saved by not handling the slitter shaft, heavy slitters, etc.

(PATENTS PENDING FOR THESE IMPROVEMENTS)

Slitting Attachments with "M. & W." Removable Bottom and Top Slitters can be supplied for drum winders, any width

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The MOORE & WHITE Co.
PHILADELPHIA, PA.
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PAPER MILL MACHINERY

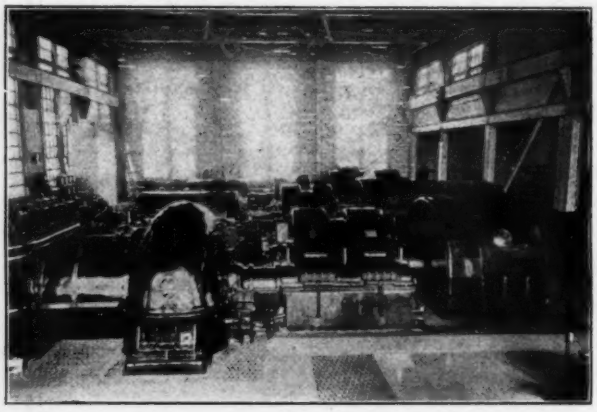
sideration of securing low power and steam costs has been pretty well realized. The installations cited will be varied in respect to both turbine type and steam supply conditions and will be presented in the order of steam pressures employed. The object of such classification is simply to show that while the present general tendency is toward the use of higher and higher steam pressures, an installation operating on more moderate pressures, provided it is fitted to the mill conditions, may prove a highly profitable investment.

Economical Installations on Pressure Below 200 Pounds

If in this day of high steam pressure operation, turbines running on steam below 200 pounds are looked upon as low pressure installations, there are quite a number of examples of this class giving excellent results in plants where unquestionably extreme care has been exercised to fit the turbine equipment to the mill conditions. At the St. Croix Paper Company, Woodland, Me., for instance, an enviable record has been established by a relatively small, 475 horsepower, impulse type turbine operating on steam at 110 pound gauge pressure, with 125 degree superheat. The unit drives the variable speed end of a paper machine making newsprint and exhausts at from 20 to 40 pounds back pressure. Through a single reduction herringbone gear and a variable speed oil governor with remote control, the speed of the turbine may be varied sensitively over a range of from 700 to 4,200 r.p.m., permitting the paper speed to be varied from 125 to 750 feet per minute.

Views of two other relatively small steam turbines, 350 horsepower units, admirably suited for paper mill use when fitted to the existing mill conditions are also shown. Both units operate on steam at 175 pound pressure and exhaust against a back pressure of 10 pounds. The single stage turbine, which is a highly efficient mechanism, was designed, proportioned for and recently installed in one of the mills on the western coast. It has a speed range of 1 to 8. The other unit is a multi-stage turbine operating in a mid-western mill and is very suitable for a machine drive with a paper speed of from 700 to 1,000 feet per minute.

A somewhat larger installation of particular interest in that it well exemplifies the extreme flexibility and adaptability of the



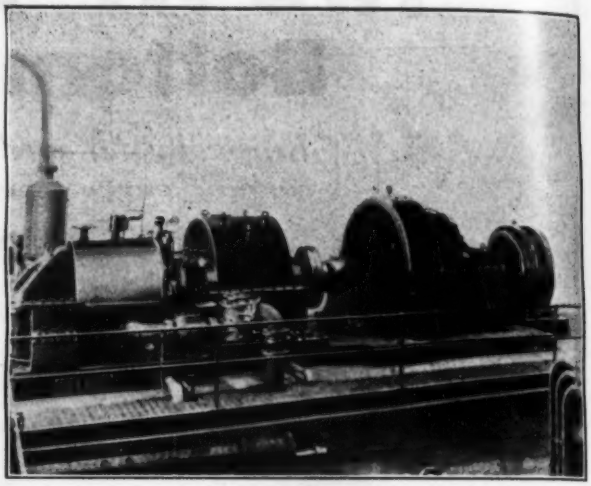
Courtesy: General Electric Co.

FIG. 6

Three 4,000-kw. geared turbine-generator sets, 1 condensing and 2 non-condensing.

modern steam turbine is the unit driving the large news print machine at the Crown Willamette Paper Company, West Linn, Ore. As originally installed, the turbine drove a 600-kilowatt direct current generator for graduated speed drives of the separate sections of the paper machine. It runs at 3,600 r.p.m. on steam at 175 pounds gauge and carrying 100 degrees superheat, exhausting at from 5 to 15 pounds back pressure. It was found, however, that the paper machine did not require as much power as could be generated by the turbine with the steam necessary for heating the drying rolls. To remedy this defect in heat balance, a 500-horsepower synchronous motor was connected to the shaft of the direct current generator and driven as an alternator, synscronized with the mill's alternating current line by a governor of the oil relay type. The added load permits all the steam required for heating the dryer rolls to pass through the turbine and while doing so to bolster up the alternating current supply in a highly profitable manner.

While this may appear very much like fitting the turbine to the

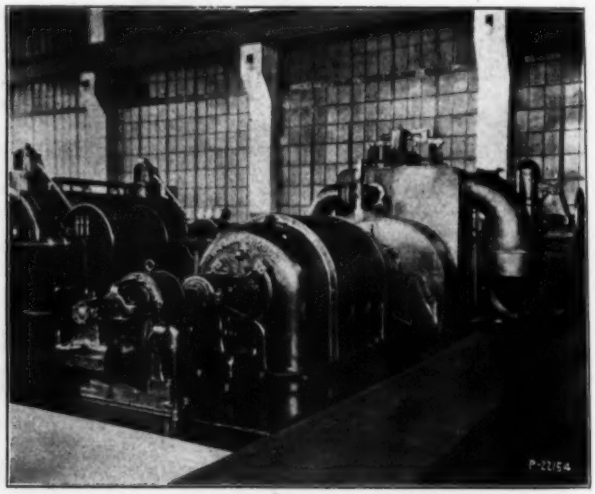


Courtesy: De Laval Steam Turbine Co.

FIG. 7

1,500-kw. multi-stage bleeder turbine installation. Watervliet Paper Co., Watervliet, Mich.

mill requirements after installation, rather than the selection of a unit fitted to the needs of the mill, the arrangement has proved a most happy one. Notwithstanding the fact that the amount of



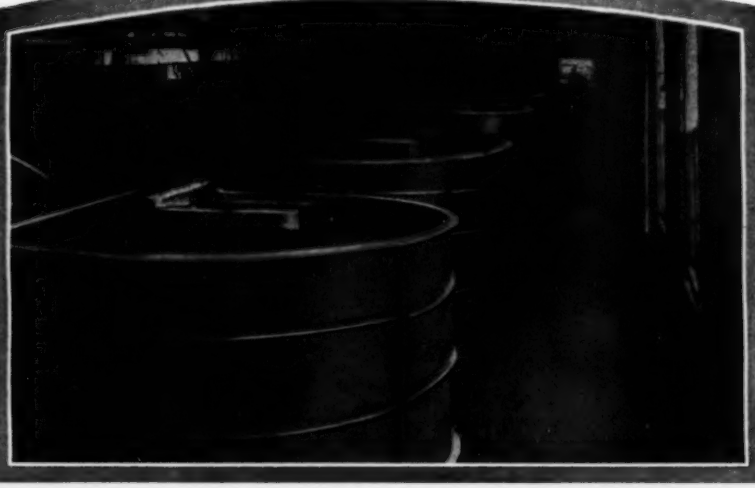
Courtesy: Westinghouse Electric & Mfg. Co.

FIG. 8

1,000-kw. turbine-generator unit installation. Bryant Paper Co., Kalamazoo, Mich.

steam for drying the paper varies quite considerably, the refitted installation is so flexible that the increased exhaust of the turbine is now ample under practically all conditions.

Within the arbitrarily set range of low pressure turbine installations, i.e., those operating on steam below 200-pound initial pressure, falls an interesting arrangement at the plant of the Warren Manufacturing Company, Milford, N. J. This is a 1,000 kilowatt unit direct connected to a 3-phase, 60 cycle, alternating current generator which is "floated" on the main 33,000 volt transmission line which supplies the remainder of the electrical load



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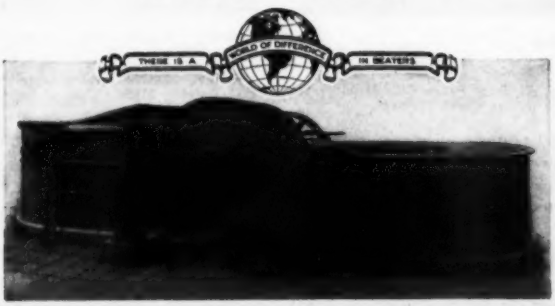


MID-WEST
MADE MILL MACHINERY

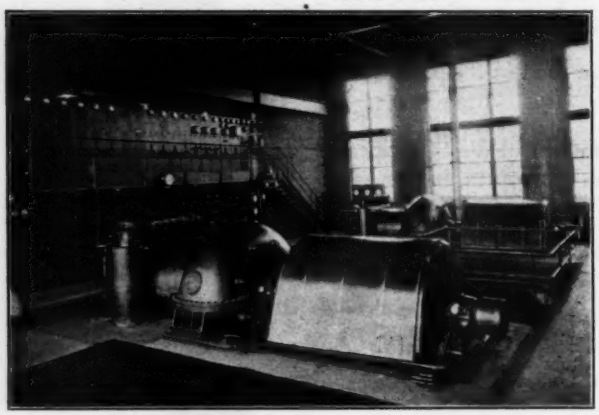
and also acts as a kind of speed governor. The unit is a non-condensing turbine designed for operation on the steam at 190 pounds gauge pressure, with 100 degrees of superheat and variable back pressure, the back pressure regulator having an adjustment range of from 2 to 18 pounds.

Three hydro-electric plants supply power to the same system, but they are located at other mills and cannot be depended upon to supply the power needs of the Milford mill. In fact, to maintain the essential load for the transmission line at outage periods it has been necessary to arrange for automatic change of the non-condensing unit regulation from back pressure control to speed control for emergency operation. This is accomplished by means of a solenoid attachment on the back pressure regulator which causes the regulator to be disengaged whenever the generator oil circuit breaker is open. When such situation pertains, the turbine is controlled by its speed governor and assumes the essential load, the other local load being disconnected. A current limiting relay serves to prevent an overload being thrown on the alternator.

Medium Pressure Installations of Note

Crouping steam turbine operation on steam of from 200 to 300 pounds pressure as medium pressure installations, under present day practices, one of the most interesting instalations is at the plant of a large mid-western mill. Three 4,000-kilowatt, 3 phase, 25 cycle, 480 volt, geared turbine-generator sets are in service, one a condensing unit and the other two noncondensing units, all arranged for automatic steam extraction at 15 pounds gauge. The steam conditions are 200 pounds gauge pressure and 100 degrees of superheat. The condensing unit exhausts to 29-inch vacuum, running like the two non-condensing units at 3,600 r.p.m., and the three turbines are individually geared to generators through single reduction herringbone gears, effecting a speed reduction of 7.2 to 1.

Another efficient turbine installation operating on steam at 200 pounds gauge, but in this case carrying 175 degrees of superheat, is that of a 1,500-kilowatt geared, multi-stage, bleeder turbine at the plant of the Watervliet Paper Company, Watervliet, Mich. This turbine also exhausts to a 29-inch vacuum and is bled in



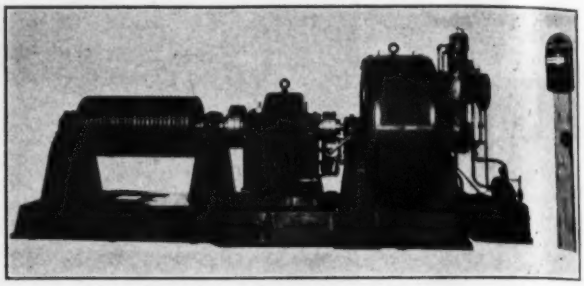
Courtesy: Westinghouse Electric & Mfg. Co.

FIG. 9

5,000-kw. turbine-generator sets at the Paul A. Sorg Paper Co., Middletown, Ohio.—Condensing, automatic extraction steam turbines.

quantities varying from 3,000 to 6,000 pounds of steam per hour at a pressure of approximately 10 pounds. The turbine runs at 5,000 r.p.m. and drives two generators 514 r.p.m., one of which is a 1,500-kilowatt, 220 volt, direct current unit and the other, on the outboard end of the shaft, a 150-kilowatt alternator. The latter supplies power for miscellaneous purposes and enables the turbine to carry its full load on the steam passed.

The view of the 1,000-kilowatt non-condensing turbine at the Kalamazoo plant of the Bryant Paper Company depicts an installation which effects such marked savings that the entire cost of the installation is returned in less than a year. The turbine is in effect a reducing valve paying handsome dividents in power developed while so functioning. The steam supply for the plant is generated at a pressure of 300 pounds, but for use in low pressure engines and auxiliaries the steam has to be reduced in pressure to 150 pounds. Prior to the installation of the turbine, the steam supply for the low pressure units was drawn directly from



Courtesy: Terry Steam Turbine Co.

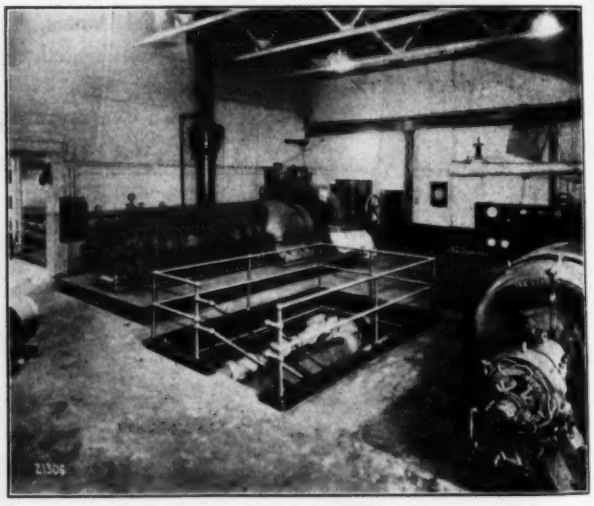
FIG. 10

500-hp. paper machine drive designed for 400-lb. steam, 200-deg. superheat. 15 or 35-lb. back pressure.

the boilers through reducing valves, sacrificing in large part the power differential between steam at 300 to 150 pounds. By substituting the 1,000-kilowatt non-condensing turbine for the reducing valves, the steam is now expanded through the turbine, attaining the required pressure reduction and at the same time securing a quite considerable supply of valuable power.

Economies at High Steam Pressures

Two 5,000-kilowatt turbine-generator sets at the Middletown plant of the Paul A. Sorg Paper Company well demonstrates the



Courtesy: Westinghouse Electric & Mfg. Co.

FIG. 11

2,500-kw. bleeder turbine installation at the Detroit Sulphite Pulp & Paper Co., Detroit, Mich. Cost of installation returned within two years by savings effected.

application of condensing prime movers to major paper mill requirements. These turbines, which operate on steam at 375 pounds pressure ladden with some 250 degrees of superheat, exhaust to a 28-inch vacuum and are of the double extraction type. Internal grid valves, which are controlled automatically, maintain extraction pressures at from 20 to 23 pounds for drying paper and at 50 pounds for cooking purposes. The balance of the steam passes to the condenser and is sufficient in amount to maintain the required electrical load.

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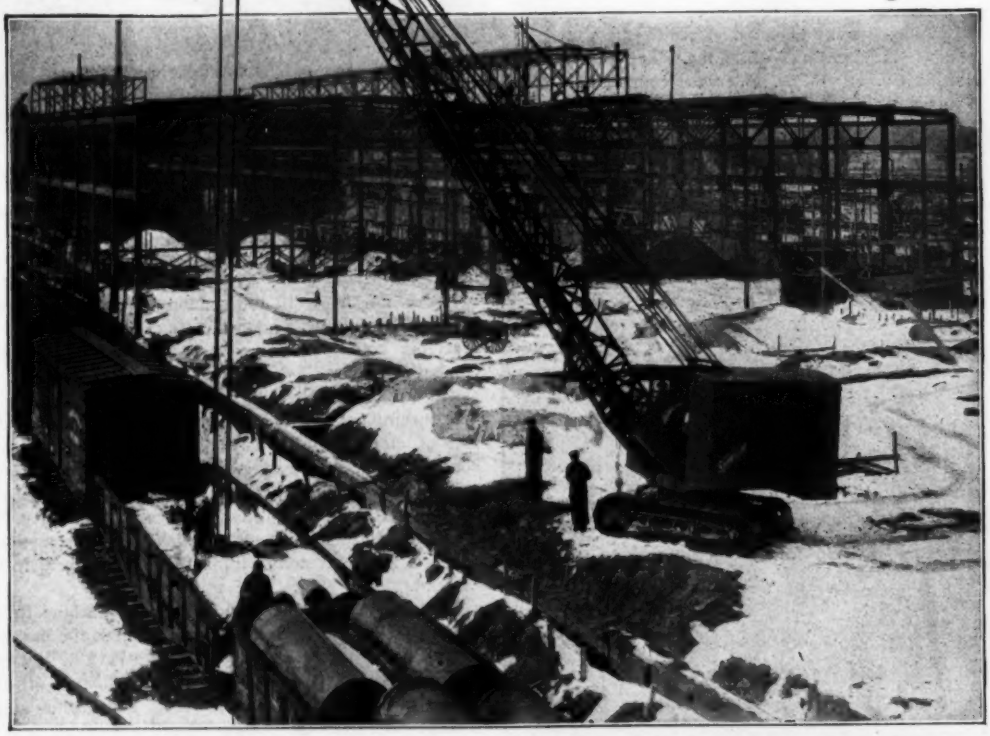

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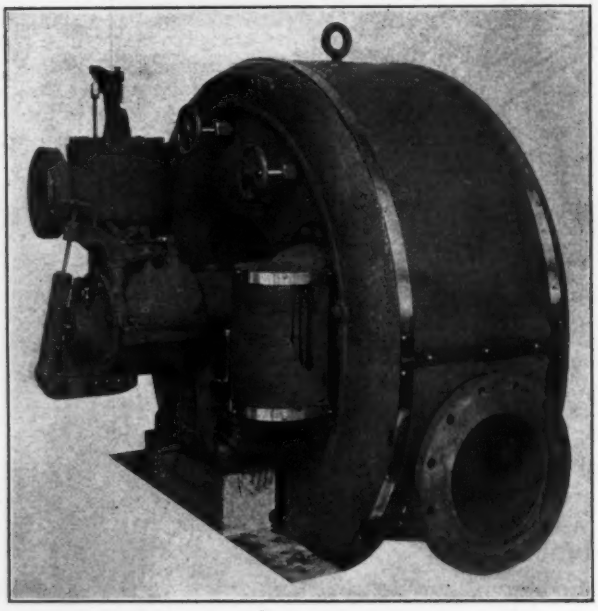
The principle of double extraction and condensing operation is also employed at the Kimberly Clark Company, Kimberly, Wis., where a 4,000-kilowatt steam turbine running at 3,600 r.p.m. drives a 5,000 kva. alternator at 500 r. p. m. Here steam is withdrawn at extraction pressures of 100 and 15 pounds independently and simultaneously to supply steam for process requirements, the balance of the steam passing to the condenser and sufficing to maintain the electrical load.

For non-condensing operation, the 500-horsepower turbine paper machine drive illustrated is representative and quite typical of the equipment now built for higher steam pressure installations. This particular unit is designed for use with 400 pound steam carrying 200 degrees of superheat and to exhaust against a back pressure of 15 or 35 pounds. It is eminently suitable for a paper machine drive with a maximum paper speed of 1,000 feet per minute.

An interesting development shown in this same view is the indicating tachometer which forms part of the remote speed control mechanism. The instrument is mounted at some convenient location near the paper machine and is equipped with two indicating needles. One of these shows the speed at which the paper machine is operating at any instant, while the other functions to bring about a speed change and is under the control of an exterior knob. A change in machine speed is affected by simply shifting the needle under the control of the exterior knob of the desired speed.

On the post supporting the speed control is a push button which in an actual installation is also mounted somewhere near the machine. It is an emergency stop, pressing the button automatically shutting down the machine drive.



Courtesy: Terry Steam Turbine Co.

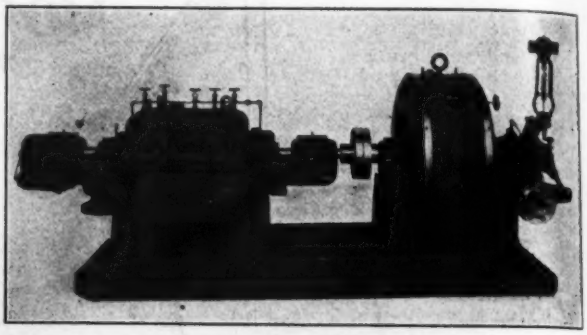
FIG. 12

Modern auxiliary drive steam turbine suitable for use with the highest commercial steam pressures and superheat.

The use of the higher steam pressures also entails the extensive use of turbine auxiliaries, for driving boiler feed pumps, blowers, etc. Two such devices are illustrated, one of which is used quite frequently for any of these services and is suitable for use with the highest commercial steam pressures and superheats. The other is a typical turbine driven boiler feed pump designed for high pressure service, provided with an excess pressure governor.

Steam Turbine Versatility

In presenting these brief sketchy notes on specific turbine installations and comments concerning available turbine equipment, the intention has been to indicate the truly remarkable versatility of the modern steam turbine. There certainly seems to be some typ of steam turbine capable of efficiently and economically meeting virtually any paper mill requirement, no matter how exacting. While no one type of turbine can be said to fit best all mill conditions, or even apparently similar conditions, there are types of steam turbines which are extremely versatile in this respect. For example, a combined automatic mixed flow and bleeder multi-stage turbine which can operate efficiently in five distinct ways is now



Courtesy: Terry Steam Turbine Co.

FIG. 13

Typical steam turbine drive boiler feed pump for high pressure service, equipped with excess pressure governor.

available. This unit can be used as a straight condensing turbine; as a back pressure turbine; as a bleeder turbine, expanding part of its steam supply to the condenser and exhausting the balance to an intermediate pressure system; as a mixed flow turbine, receiving both high and low pressure steam and exhausting to condenser; and as a low pressure turbine, receiving low pressure steam only.

A turbine as versatile as that just described would appear capable of meeting almost any mill conditions and requirements encountered. Frequently this may be so, but the dominant consideration should always be fitting of the turbine to the mill conditions. A satisfactory heat balance is imperative, but there are also the considerations of simplicity of construction, investment entailed, space accommodations and many others to be taken into account.

If an approved type of modern steam turbine fails to give the results which can reasonably be expected, the failure nine times out of ten is traceable to poor engineering, to not having sufficiently considered all the factors which influence fitting the turbine to the mill conditions, and is rarely a reflection upon the misfit turbine installed. Of course, if mill conditions and requirements change a different type of steam turbine may become advisable, but if this does transpire it is particularly necessary to know just what is required and exercise due care in fitting the turbine to the new operating conditions. This cannot be emphasized too strongly.

It should also be remembered that while there are important benefits to be secured by employing steam at high pressures, it costs far less, as a rule, to make the most effective use of existing plant provisions.

James McLean Goes to Canada

[FROM OUR REGULAR CORRESPONDENT]

THERESA, N. Y., May 21, 1929.—James McLean, who was formerly employed at the Deferiets mill of the St. Regis Paper Company and later superintendent of the Sherman Paper Mills, has left for Canada where he will take an executive position with a company which will soon commence the erection of a large paper mill a short distance from Ottawa. It is understood that the new mill will require a year for construction.

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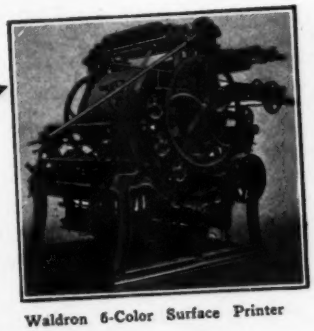
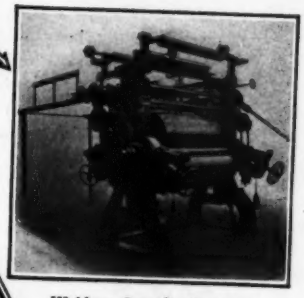
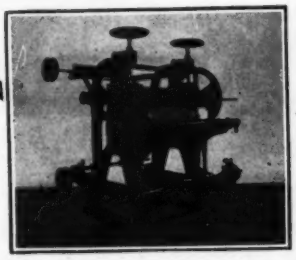


Waldron 6-Color Surface Printer



Waldron Intaglio Printer



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New York Trade Jottings

The Walker-Goulard-Plehn Company, Inc., paper merchants, of 450 Pearl street, New York, have applied for membership in the National Association of Waste Material Dealers, Inc.

* * *

R. G. Macdonald, secretary of the Technical Association of the Pulp and Paper Industry, attended the Interstate Technical and Cost Meeting at Kalamazoo, Mich., on May 17 and 18.

* * *

Lewis Jennings has resigned from E. Butterworth & Co., dealers in rags and paper stock, of 15 East 26th street, New York. Mr. Jennings had been with the organization for many years.

* * *

Lauri I. L. Durchman, of Petersburg, Va., a pulp and paper mill engineer, who has invented several new methods of making high alpha cellulose, visited the TAPPI offices at 18 East 41st street, New York, last week.

* * *

Major O. M. Porter, secretary of the American Paper and Pulp Association, with headquarters at 18 East 41st street, New York, attended an important meeting of the Glazed and Fancy Paper Manufacturers' Association at the University Club in Boston last Tuesday.

* * *

The Traffic Department of the National Association of Waste Material Dealers, Inc., announces that effective May 30, the New York Central rate on paper stock, minimum weight 20,000 lbs., from New York and Brooklyn station to Norfolk and Raymondville, N. Y., will be 27 cents per 100 lbs., including lighterage.

* * *

The mills of the American Writing Paper Company, at Holyoke, Mass., and the United States Envelope Company, at Springfield, Mass., were inspected last week by twenty honor students of the New York Employing Printers' Association, as guests of the Beekman Paper and Card Company, New York.

* * *

Technical Economist Corporation, Fidalgo Drying Systems, announces its removal from 40 Rector street, to new and larger quarters in the Chanin Building, located at 122 East 42nd street, New York City. The new telephone numbers are: Lexington 0985 and 1079.

* * *

Everett J. Schwantee, of the Gulick Henderson Company, of 4130 Addison street, Chicago, has been accepted by the Joint Committee on Approved Pulp Testing Chemists for the Paper Industry of the United States, with headquarters at 18 East 41st street, New York, as an approved commercial pulp testing chemist and is listed as such, effective May 16, 1929.

* * *

Report of MacAndrews & Forbes Company for quarter ended March 31, 1929, shows net profit of $289,885 after expenses, federal taxes and company's proportion of loss of subsidiaries, equivalent after dividend requirements on 6% preferred stock to 67 cents a share on 383,539 no-par shares of common stock. This compares with $268,397, or 63 cents a share on 378,500 common shares in first quarter 1929.

* * *

International Combustion Engineering Corporation stockholders at the annual meeting voted to increase authorized no-par common stock to 1,150,000 shares from 1,100,000 shares. Increase of authorized common capitalization by 50,000 shares is to make available stock for conversion of a similar amount of preferred stock which was offered to stockholders of record April 26 on the basis of one share at $100 to every 20 shares of common or preferred held. Nathan L. Amster was elected a director. Retiring directors were re-elected.

J. W. LeMee, formerly associated with the Lake St. John Paper Company, at Dolbeau, Canada, has recently joined the Magnuson Products Corporation, manufacturers of industrial cleaners, of Brooklyn, N. Y., as its selling representative for Canada. Mr. LeMee's work will deal chiefly with the problem of slime removal, by the application of XCEM No. 70 Slime Remover, which is one of their many formulas.

H. Z. Schniewind Addresses Paper Salesmen

The regular weekly luncheon and meeting of the New York Division of the Salesmen's Association of the Paper Industry, held in the Canadian Club, Belmont Hotel, New York, last Monday, attracted an excellent attendance.

S. C. Knode, of the Albemarle Paper Manufacturing Company, president of the association, occupied the chair and after a few timely remarks introduced the principal speaker, H. Z. Schniewind, of the Foreign Paper Mills, New York City.

Mr. Schniewind gave an exceptionally interesting and instructive address on "Paper Testing Methods," mentioning the many important improvements brought about in industry through up-to-date testing devices. He described the Quadrant Balance Scale and the Pocket Folding Scale used in determining the weight of paper.

The Folding Endurance Test, he declared, was the principal test of paper quality and he mentioned that the United States Printing Office had recently adopted this method for testing kraft paper. Tensile Testing Machines for determining the percentage of stretch were also described.

Mr. Schniewind also described various other testing methods, including Michrometers, Bursting Tests, Beating Tests, Blotting Tests, Acid Tests, Ash Tests, the Count Method, etc.

W. G. MacNaughton, of the News Print Service Bureau; R. G. Macdonald, of the Technical Association of the Pulp and Paper Industry; Dr. E. O. Merchant, of the Paperboard Industries Association, and others, participated in the interesting discussion which followed Mr. Schniewind's excellent and informative address, which was deeply appreciated by all present.

New York Paper Men Play Golf

The growing popularity of the game of golf among the men in the paper trade was well attested by the large attendance at the annual tournament of the New York Paper Trade Golf Association, held May 14 and 15 at the Shackamaxon Golf Club, Westfield, N. J. More than 50 men played in the qualifying round, in spite of the rain, and play continued throughout two days of the keenest competition. The annual dinner was held Tuesday night and was attended by 75 members of the association.

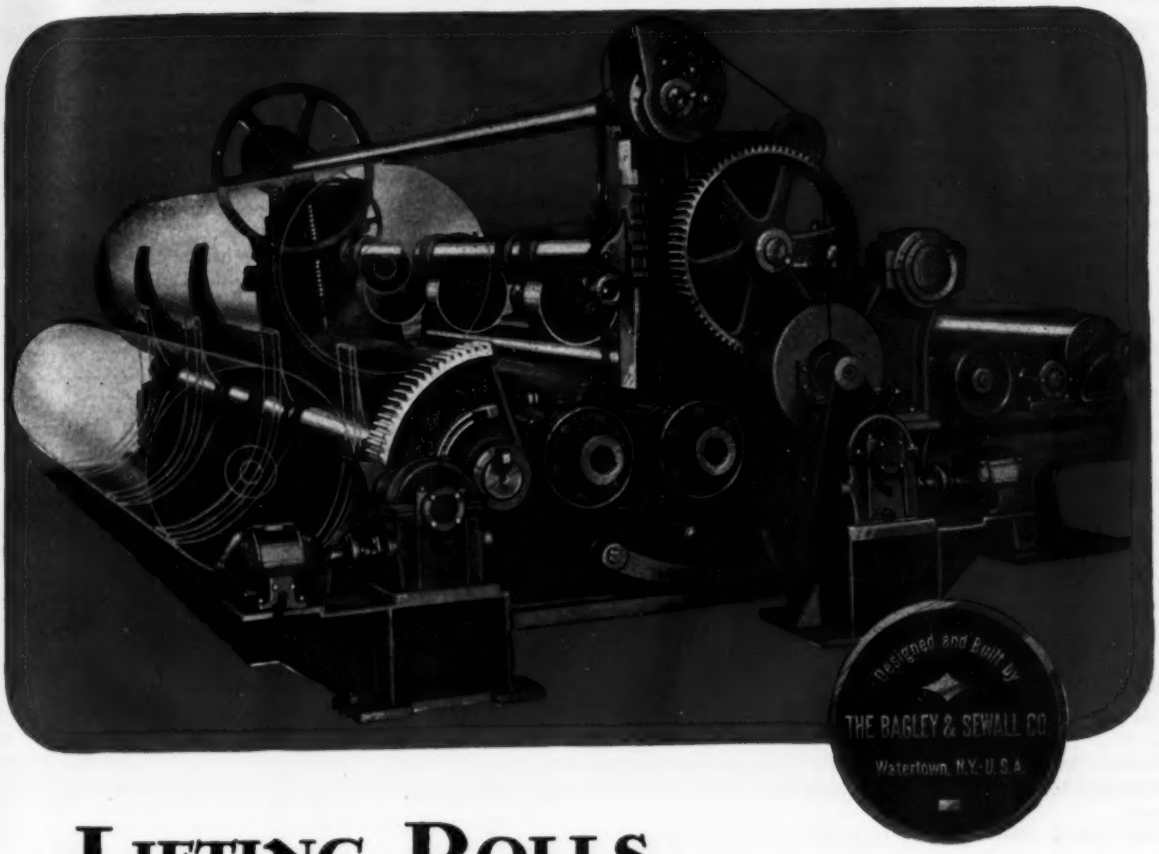
The following officers were elected: President, K. S. Warner; vice-president, O. Marquardt; treasurer, B. C. Hill; secretary, H. A. Earle.

The list of prize winners was: Low Gross, Ward Birch; Clarence Clough Prize, low net, Alex Calder; kickers' handicap, K. S. Warner; 36 hole, low net, Fred Burkhardt. Match play winners: Championship, Alex Calder; 2nd. Eight, Bud Berrien; 3rd Eight, A. Pagel; 4th. Eight, W. E. Shuttleworth; 5th. Eight J. A. Downs; 6th. Eight, Oswald Marquardt.

Du Pont Cellophane Co. Changes

O. E. Adamson, formerly general assistant treasurer of the Du Pont Cellophane Company and the Du Pont Rayon Company, has been elected secretary and treasurer of both companies, vice Clayton M. Albright.

Mr. Albright has been elected vice president and member of the executive committee of the Du Pont Cellophane Company and the Du Pont Rayon Company, effective May 1, with offices at New York, vice Maxwell Moore, who has been transferred to the Treasurer's Department of E. I. du Pont de Nemours & Co., Wilmington, Del.



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Fir-Tex Plant Assured

PORTLAND, Ore., May 17, 1929.—At a meeting of stockholders of the Fir-Tex Insulating Board Company, held in Portland, early in May, authorization was given for preliminary work on the proposed plant to be built at St. Helens, Ore., according to announcement coming from H. F. McCormick, president of the company and one of its head organizers.

About two-thirds of the $2,000,000 capital stock has been subscribed. The company has purchased 167 acres of land and the factory will be built on Sacpoose Bay near its entrance to Willamette slough. The plant and site will represent an investment of almost $2,000,000 and when completed will employ 200 persons. There will be both rail and water facilities available for shipping purposes.

The Fir-Tex Insulating Board Company was organized early in August of 1928, and the first meeting of the stockholders was held in Portland, September 4, at which time the board of directors was chosen and election of officers held. The Tom G. Taylor Company, of Portland, is handling the financing.

Kenneth D. Dawson, of Portland, is vice-president; A. E. Millington, inventor of the process for manufacture, is vice-president and general manager, and Wm. Eibel, secretary-treasurer.

The plant when completed is scheduled to cost $2,500,000 with the first unit to be completed within a year. The preliminary work recently announced will include clearing of the site, laying of the water mains, improvements in the water front and building of spur tracks.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 20, 1929.—The regular luncheon meeting of the New England Paper Merchants Association is to be held Thursday, May 23, at the Chamber of Commerce. The members are to take action on the question of making a drive for membership.

The Charles River Country Club will be the objective point for members of the Boston Paper Trade Association, Tuesday, June 11, when their annual outing will be held. At the March meeting of the association a large majority expressed a preference to hold the summer meeting at Rye Beach. The executive committee did everything possible to effect arrangements for the New Hampshire rendezvous, but through no fault of theirs, the plans did not materialize.

The Globe Paper Company has become the exclusive New England agent for the Holyoke Cover and Text, manufactured by the Advertiser Paper Company, Holyoke, Mass.

The engagement of Walter J. Dobson, salesman for the Storrs & Bement Company, to Miss Corrine Marie Obey, of Somerville, Mass., has been announced.

The Tileston & Hollingsworth Company have an exhibit in the lounge of the Boston Chamber of Commerce, consisting of a reproduction of a cover of a pamphlet made for the Raymond & Whitcomb Company. The stock used is Milton and Crinoline colors.

C. O. Brown, of the Davey Company, called on the trade here recently.

Northwestern Pulp & Paper Co. To Seek More Funds

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., May 17, 1929.—At an all-afternoon session of the stockholders of the Northwestern Pulp & Paper Company at Astoria, Ore., on May 1, it was decided to undertake to raise $150,000 additional money upon the representation by the board that such a sum would insure carrying out of the contract for a 120-ton pulp mill there, by H. O. Schundler of New York. Of the $250,000 or more taken in on stock subscriptions thus far, the greater part has been spent in promotion work and other expenses.

A committee was appointed to investigate thoroughly the financial condition of the company and to report back at a later date. This committee consists of Burr E. Tatrow, of Oregon City; E. H. French, of The Dalles; W. A. Wood, of Ranier, and James L. Hope and O. K. Atwood, of Astoria.

The financing of this company began first about two years ago. After some delay a contract for construction was let to the Austin Company to start work May 2, 1928. Since that time other delays have occurred which have interfered with completion of the plant according to first plans.

The company one year ago had an authorized capital of $1,000,000 of bonds, $2,000,000 of 7 per cent preferred stock and one share of no-par common for each share of preferred. The Northwest Pulp and Paper Company is headed by Charles F. Flint, of New York, and C. W. King, of the DuPont interests, who is chairman of the board of directors. G. C. Fulton, of Astoria, is secretary. B. T. McBain, consulting engineer, of Portland, and executive vice-president of the company, has been active in promoting the enterprise.

Leeds & Northrup Co. Expansion Program

PHILADELPHIA, Pa., May 13, 1929.—Through the purchase of adjoining property the Leeds & Northrup Company has just secured 190,000 additional square feet of property including approximately 85,000 square feet of additional floor space in a modern one story building of saw-tooth roof construction, ideally adapted to its manufacturing processes.

The new building will be made integral with the present building by means of a connecting wing, on the construction of which work has begun.

The rapid expansion of the Leeds & Northrup Company business effects practically all of its sales divisions including automatic control and recording instruments for temperature in industry, Hump and Homo Furnace equipment for the accurate heat treatment of steel and other metals, the automatic metered control of combustion in boiler fired furnaces, conductivity equipment for automatic control in process industries, frequency control for central stations and automatic power plant instruments in general, in addition to the well-known Leeds & Northrup line of precision measuring instruments for educational, laboratory and research purposes.

This growth and expansion of manufacturing facilities reflects the increased interest which industry everywhere is showing in more accurate methods for controlling various quantities such as temperature, conductivity, frequency, speed, combustion, etc.

Birmingham To Reorganize

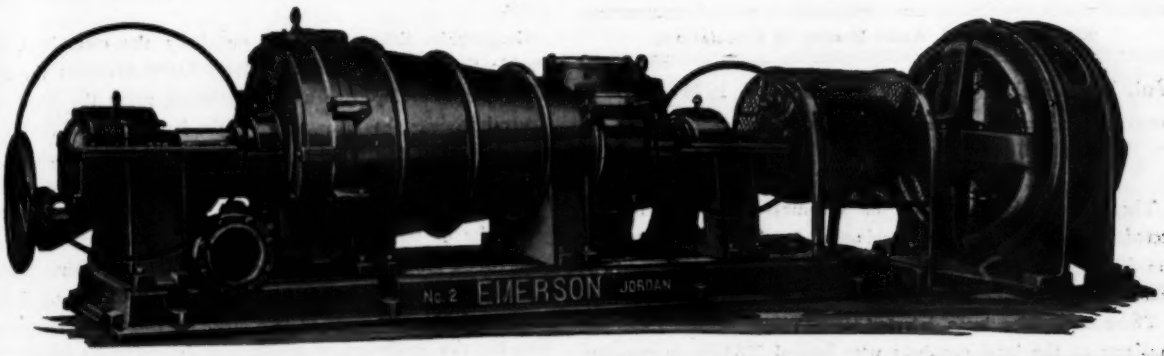
The Birmingham paper merchants are planning a reorganization and renewed activities as a result of a recent visit to that city by Frank Floyd, the secretary of the National Paper Trade Association and Mr. Newell of the Jackson Paper, Jackson, Miss., the president of the Southern Paper Trade Association. A luncheon was held at the Tutwiler at which these gentlemen were present and offered remarks and suggestions as to the work which the local organization should attempt. Present at the luncheon were Mr. Alvis, Graham Paper Company, Mr. Gabbert, Whitaker Paper Company, Mrs. Strickland, Strickland Paper Company, Mr. McClelland and Mr. Coker of the Birmingham Paper Company, Mr. Friedman of the City Paper Company, and Mr. Beatty of the American Writing Paper Company.

Taunton Paper Stock Plant Damaged By Fire

[FROM OUR REGULAR CORRESPONDENT]

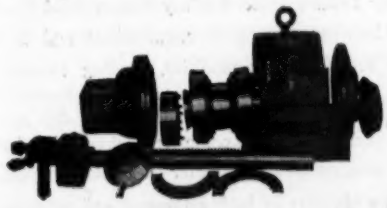
BOSTON, Mass., May 20, 1929.—Fire of undetermined origin damaged the plant of the Berry Paper Stock Company, Railroad avenue, Taunton, Mass., to the extent of $75,000, Friday, May 17. The fire is the second that this concern has had in the last 18 months. In the fall of 1927 its plant was burned to the ground. The one just damaged was built to take its place. The $75,000 loss is almost total for the owner, James A. Berry. The only insurance carried was on the machinery, about $8,000. The stock of the company was so inflammable that it was practically uninsurable.

The EMERSON JORDAN *equipped with the* Bolton BANDLESS Plug



Patents Pending

Showing construction of the Bolton Bandless Plug. Knives and woods cannot come out. *NOTE INVERTED EDGES.*



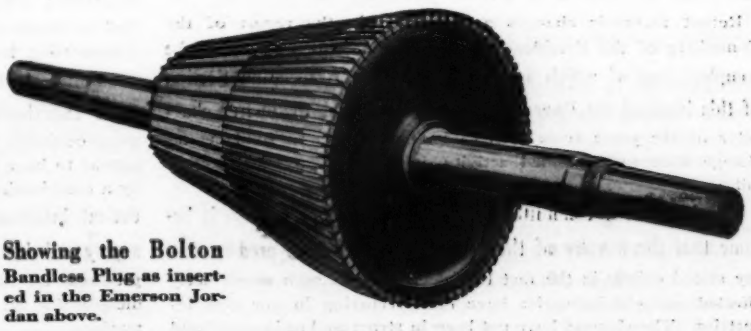
Detail of Timken end bearing which takes care of both radial and thrust.

Now every Emerson Jordan offers you the tremendous advantages of the Bolton BANDLESS Plug and Timken Roller Bearings.

These two great features put the Emerson Jordan in a class by itself for unit control, lasting satisfaction and true economy. No other Jordan has these great construction advantages.

Make sure of all the benefits and savings that result from these two wonderful improvements in Jordan engineering. Standardize on Emerson Jordans.

Write for full information and estimates



Showing the Bolton Bandless Plug as inserted in the Emerson Jordan above.

The EMERSON MANUFACTURING COMPANY

LAWRENCE ∞ ∞ ∞ MASSACHUSETTS

DIVISION OF JOHN W. BOLTON & SONS, Inc.

2683

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ESTABLISHED 1872

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TAPPI FALL MEETING AT RICHMOND

The executive committee of the Technical Association has selected Richmond, Va., and Washington, D. C., as the places for the fall meeting of the Association which will be held on September 24 to 27 inclusive.

These two cities were selected as a result of the great enthusiasm of the local members who invited TAPPI to consider Richmond and Washington for the fall meeting.

Both cities have acquired an enviable reputation as convention centers and offer much that will interest pulp and paper men. Richmond the home of the Albemarle, Standard, Chesapeake and Bedford Pulp and Paper Companies are manufacturers of kraft, blotting and other grades of paper and in these mills are many recent installations of equipment.

Washington has its Bureau of Standards, Government Printing Office, Bureau of Engraving and District of Columbia Paper Mill as well as many other attractions of interest to any visitor to the capitol city.

September and October are delightful months in Virginia and a real reception of the type known as southern hospitality will await all who attend the meeting.

ECONOMIC CHANGES REVEALED

Recent economic changes are revealed in the report of the Committee of the President's Conference on Unemployment, the complete text of which appears in the Cost Association Section of this issue of the PAPER TRADE JOURNAL. The distinctive character of the years from 1922 to 1929 owes less to fundamental change than to intensified activity, in the opinion of the committee.

The longer the committee deliberated, the more evident it became that the novelty of the period covered by the present survey rested chiefly in the fact that developments such as formerly affected our old industries have been recurring in our new industries. The changes have not been in structure but in speed and spread.

None of the changes in distribution on which emphasis has been laid in the last few years is basically new. Hand-to-mouth buying is old; sudden changes in style and demand are familiar; there is no new principle in installment selling; co-operative marketing is no modern discovery. But the breadth and scale and tempo of recent developments give them new importance.

Perhaps the most important of the characteristics of the years covered by the survey are: The increased supply of power and its wider uses; the multiplication by man of his strength and skill through machinery; the expert division and arrangement of work in factories and in the trades, so that production per man-hour of effort has risen to new heights; the quickening of these instrumentalities through capital provided for the surplus incomes of a constantly widening proportion of our people—all these factors represent an accumulation of forces which have long been at work.

Geographic differences were noted by the committee. The Pacific States have made an extraordinary advance; the South has rapidly developed as a manufacturing area; the East North Central Division has grown; while the New England States, and to some extent the Middle Atlantic section, have developed less rapidly and have experienced some difficulties in adapting their older industries to new conditions.

In spite of this variability, however, this difference in activity as between groups and areas and industries, the rising standard of living characteristic of this period was widespread and has reached the highest level in our history. Characteristic also has been the rise in the use of power and the extent to which power has been made readily available for driving tools of increasing size and capacity and for a convenient diversity of purposes in the smallest business enterprise.

Factories no longer cluster about the sources of power. Widespread inter-connection between power plants, arising out of an increasing appreciation of the value of flexibility in power, and made possible by technical advances during recent years, has created huge reservoirs of power, so that abnormal conditions in one locality need not stop the wheels of industry.

The committee found that the increasing flexibility with which electricity can be delivered for power has enabled manufacturers to meet high labor costs by the application of power-driven specialized machines. The survey shows that as a nation we now use as much electrical energy as all the rest of the world combined. Through the subdivision of power, the unskilled worker has become a skilled operator, multiplying his effectiveness with specialized automatic machinery and processes. Thus, the unit cost of production has been reduced.

Increasing tendency toward price stability was noticed by the committee, both as between classes of commodities and in the price experience of individual commodities, tending towards a more equitable basis of exchange of products. Price fluctuations appear to have been held within narrow limits during this period by a combination of factors—a more complete background of statistical information making possible better judgment regarding supply and demand on the part of both producers and consumers, prudence on the part of management, cost reductions by technicians, skill on the part of bankers, and the expansion of foreign markets.

The committee believes that as long as productivity can be consistently increased, we can go on with increasing activity if we develop a technique of balance. Toward such a technique the

committee believes the skillful work of the economists, engineers and statisticians who prepared the survey on which the facts and interpretations expressed in the report are based, will contribute. A study of the fact-finding survey, as a whole, to all who are faced with the problems of business administration and public leadership, is recommended by the committee.

International's Newspaper Investments

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 19, 1929.—In a continuation of its inquiry into newspaper financial holdings of the International Paper and Power Company, the Federal Trade Commission subjected to examination two vice presidents of the International. Today's hearing covered the acquisition of stock of the *Boston Herald* and the *Boston Traveler* and the efforts of Harold Hall and William LaVarra of New York to purchase a number of leading Southern newspapers with the financial backing of the International, besides the four newspapers in Georgia and South Carolina already purchased by them with an advance of $870,000 from the International.

Neal C. Head, vice president of the International Paper and Power Company and assistant to the president of the company said that the directors of the International at a meeting on October 1, 1928, authorized a fund of not more than $2,500,000 to be used under the jurisdiction of Mr. Graustein for the purchase of newspapers in the Southeast by Mr. Hall and Mr. Lavarre.

"We had an arrangement by which Hall and Lavarre would have the management of the newspapers," he continued. "And we would advance the capital. They were instructed to report the purchase price and earnings of the newspapers which they bought. In general, they were told to get options on newspapers at approximately ten times the earnings. They had no authority to make any binding offers, but the general understanding was that we would back them in any newspapers where they could come to an agreement.

"Late in February, after they had bought the Augusta and the Spartanburg papers, we informed them if they bought the Columbia newspaper to stop any further purchases. The entire deal with Hall and Lavarre is in a transition period. It is carried as a personal loan until they are able to redeem their obligation, and if they are not able to do so we will put their four newspapers on some other financial basis."

F. D. Comerford, also a vice president of the International, testified that he had opposed the acquisition of the interest by his concern in the *Boston Herald* and the *Traveler*. "I protested against the action, as I felt that it would be misunderstood by the general public," he declared.

St. Regis Earnings Show Gain

The St. Regis Paper Company has issued its annual report for year ended December 31, 1928, submitting for first time a consolidated statement including subsidiaries, showing net income of $5,952,316 after depreciation, interest, all taxes and minority interest in subsidiaries, equivalent after 7 per cent preferred dividends to $9.36 a share on 600,000 no-par shares of common stock which were outstanding practically the entire year and $7.50 a share on 750,000 shares outstanding at end of the year. This compares with consolidated net income of $1,133,594, or $1.62 a share on 587,780 shares of common in 1927.

Net profit of the St. Regis Paper Company only for year 1928 was $2,274,679 after depreciation, interests and all taxes, equivalent after 7 per cent preferred dividends to $3.23 a share on 600,000 common shares outstanding practically the entire year and $2.5. a share on 750,000 shares outstanding at end of year. This compares with $1,224,956, or $1.78 a share on 587,780 common shares in 1927.

Mr. Treadway Speaks on Paper Schedule

WASHINGTON, D. C., May 22, 1929.—"The schedule in which my own district is perhaps more directly interested than in any other," said Representative Treadway, of Massachusetts, speaking on the tariff on the floor of the House, "is the paper schedule." On this subject he continued:

"The paper industry, particularly the high-grade writing paper, is a very competitive industry in this country, and while we surpass foreign countries in its manufacture, there are large importations coming into our markets at the present time.

The manufacturers of paper in this country have not asked for any special changes in tariff rates. They have asked for changes in the bill in the line of better descriptions and better explanations, in order that there should be no confusion at the customhouse.

"The only material change that was taken up by our subcommittee in reference to the paper schedule had to do with news print.

"At one time the subcommittee thought that a definition of standard news print should be inserted in the law, but we thought that was a matter for the officials to regulate rather than to make it a matter of law. I found I was mistaken about news print. I supposed the original intention of Congress was to regulate the free importation of paper actually used by newspapers. That is not correct. There is no distinction today, and probably should not be any distinction, on the uses made of what is known as standard news print paper. It can be used for other purposes than for printing newspapers, and it was the intention of Congress that it should be so used, and therefore it is not limited to newspaper publications.

To Make Rotogravure and Book Papers

The Consolidated Paper Company of Wisconsin Rapids, Wis., widely known producer of ground wood papers, will begin immediate production on a large scale of rotogravure and book papers, the entire output to be handled by the Seaman Paper Company of Chicago, and its eight branches, it was announced by George W. Mead, president of the Consolidated Mills, and by George M. Seaman, president of the Seaman Company.

The object of the Consolidated Mills, noted at present for high quality news print and high standards in all ground wood products, will be to market, through Seaman, a new line fully in keeping with the demands of the advertiser and the consumer for higher quality papers in this class and to fulfill the requirements of the new high press speed necessary to meet present day circulation, Mr. Mead said.

The rotogravure paper, upon which exhaustive research has been expended, will fill a definite need based on increased popularity of roto printings and demands for quality.

Announcement of the new plans followed a thorough study of the field from the consuming as well as the manufacturing end, and the Consolidated plant is ready to begin production of the new stocks with its present equipment supplemented by additional facilities.

The move closely follows the announcement of the acquisition of Peter J. Massey, formerly vice president and general manager of the W. F. Hall Printing Company as vice president of the Seaman Company, and the closer knitting of the Seaman organization and the Bryant Paper Mills, Kalamazoo, Mich., through the arrangement whereby Frank M. Stephens, Seaman vice president, became vice president and director of sales of the Bryant Mills.

Paper Index Number for April

WASHINGTON, D. C., May 22, 1929.—The April wholesale price index number for paper and pulp was 87.8 compared with the same figure for March and with 90.2 for April of last year, taking 1926 at 100, according to the Bureau of Labor Statistics, Department of Labor.

Events of 1909

Over 20 Years Ago E B G Pioneered in the Manufacture of Liquid Chlorine

Opening of the Queensboro Bridge

The first pound of Liquid Chlorine produced in the U. S. A. 1907

THE year 1909 was marked by events which were destined to have an important influence in later years.

Two of these events had an immediate bearing on business and industry. The Queensboro Bridge, opened that year to traffic between New York City and populous Long Island, vastly facilitated communication. The first practical production of Liquid Chlorine by E B G enabled various industries to place bleaching on a better and more economical basis.

In the twenty years that have elapsed, the work of E B G has continuously displayed the pioneer spirit. The quality of this Liquid Chlorine has been maintained at the highest point. Cooperation of a nature vital to the utmost profit from the use of Liquid Chlorine is an integral part of the E B G policy. E B G can serve *you* to your complete satisfaction.

Liquid Chlorine

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

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9 East 41st Street
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Section of the
Technical Association of the Pulp and Paper Industry

AN ORGANIZATION FOR THE ENCOURAGEMENT OF ORIGINAL INVESTIGATION AND RESEARCH WORK IN MILL ENGINEERING AND THE CHEMISTRY OF PAPER, CELLULOSE AND PAPER-MAKING FIBERS GENERALLY; IT AIMS TO PROVIDE MEANS FOR THE INTERCHANGE OF IDEAS AMONG ITS MEMBERS IN ORDER THAT PROCESSES OF MANUFACTURE MAY BE MADE MORE EFFICIENT AND IMPROVED ALONG TECHNICAL LINES.

Edited by
RONALD G. MACDONALD, Secretary

Review of Cellulose Chemistry Developments*

By John L. Parsons[1]

Several years ago the Cellulose Division of the American Chemical Society undertook, through one of its committees, the preparation of a standard cotton cellulose and a report[2] was published covering a tentative method for this purpose and proposed methods of analysis. It has long been the custom to consider absorbent cotton or filter paper as pure cellulose but, owing to the fact that the method of purification employed or the source from which the cellulose is derived was seldom known, this notion has led to misunderstandings and discrepencies in analytical data. It seemed advisable, therefore, to prepare an extremely pure cellulose according to specific standard procedure. Only in this way are investigators assured of dealing with an identical well-defined compound for their research work.

The purity of a cellulose material is usually defined with reference to certain chemical constants, such as the ash, copper number, alpha-cellulose, furfural or pentosan, etc. These analytical methods are known to be extremely empirical in their nature and in certain cases there are different procedures actually in use so that the results obtained are not directly comparable. Consequently the Cellulose Division of A. C. S. was not entirely satisfied with the methods of analysis employed for their standard cotton cellulose and believing that they could be improved with the accumulation of more exact knowledge of cellulose and its associated compounds, several committees were appointed to investigate the whole situation. Recently two of these committees have published tentative standard methods for the evaluation of cellulose quality and it is to these contributions, as well as to numerous others recently presented before the Cellulose Division of the A. C. S., the writer would solicit the attention of Technical Association members, believing that some of these findings should be of considerable interest and use to the pulp and paper industry.

The desirability of having standard methods has been discussed in several general meetings of this Association but little attention has been paid to the standardization of chemical methods for the testing of our cellulosic raw material. As a matter of fact one of the main objects for the formation of the Cellulose Committee, as given in an issue of the Association Papers[3] several years back, was to investigate the standardization of chemical methods for the testing of pulp. The writer hopes therefore, that interested members of the Technical Association will have occasion to try out any new or revised methods for evaluating pulp quality during the coming year and will later offer their frank criticisms of the value of these tests.

*Presented at Annual Meeting of TAPPI, New York, Feb. 1929.
[1]Member TAPPI; Research Chemist, Hammermill Paper Co., Erie, Pa.

One of the recently published tentative standard methods of the Cellulose Division of the A. C. S., to which reference has just been made, is that for determining the viscosity of cellulose in cuprammonium hydroxide.[4] This test has become a routine procedure among users of chemical pulp and other cellulose material and many of them include the viscosity value in their specifications for purchasing this raw material. Depending upon the method employed the viscosity may vary greatly and the need for a standard procedure has become evident. Although the proposed standard method is too lengthy for inclusion in this paper, it may be possible to reprint the article in a future issue of the Paper Trade Journal.

Alpha Cellulose

The determination of alpha-cellulose in pulp, etc., has already been discussed at considerable length in previous Cellulose Sectional meetings of this Association and the desirability of a standard method has been pointed out.[5] The Cellulose Division of the A. C. S., through Dr. George J. Ritter, has just published its tentative standard method[6] which is based on an intensive program of work extending over a period of three years. This method has been tried in eight laboratories on samples of cotton linters and sulphite pulps and has been found to give the best results of all the procedures tested. The alpha-cellulose method recommended by the Division is as follows:

Preparation and Conditioning of Sample

The cotton is given no preliminary treatment. Pulps are cut into 0.5-inch (1.25) squares. The material to be used for moisture and alpha-cellulose determinations is placed in a glass-stoppered bottle or equivalent fruit jar for 48 hours to attain a uniform moisture content throughout the sample.

Approximately a 3-gram sample, weighed accurately in a weighing bottle, is placed in a 250-cc. Pyrex beaker. Thirty-five cubic centimeters of 17.5 per cent, carbonate-free sodium hydroxide solution (17.5 grams of sodium hydroxide in 100 grams of solution) (20°C.) are added (see Notes for the preparation of the same) and the solution is allowed to stand for 5 minutes. With a short glass rod, the end of which has been flattened out to form a disk 1 cm. in diameter, the pulp or cotton is macerated for 10 minutes, adding intermittently in 10-cc portions a total of 40 cc. of sodium hydroxide solution (20°C.) during this interval (see Notes). The beaker is covered with a watch glass. After 30 minutes' additional mercerizing treatment in a water bath at 20°C. (total mercerization time, 45 minutes), 75 cc. of distilled water (20°C.) are added to the alkali-cellulose mixture followed by thorough stirring. The contents of the beaker are kept in a dark

room until the bleach was exhausted, the alkalinity crucible (see Notes) having a finely perforated bottom, allowing the cellulose to form its own mat. The filtrate is poured through the mat a second and a third time, if necessary, to catch any fine material. The residue in the Gooch crucible is washed with 750 cc. of distilled water (20°C.) by means of suction. The suction tube is disconnected, 40 cc. of 10 per cent acetic acid (20°C.) are added and allowed to soak 5 minutes. Then the suction tube is applied to remove the acid. The alpha-cellulose is washed with distilled water (20°C.) until free from acid. Litmus paper is used to test the filtrate (see Notes). The alpha-cellulose is carefully removed from the Gooch to a tared, flat glass-stoppered weighing bottle. The alpha-cellulose is opened and dried at 105° C. to a constant weight—that is, the first constant consecutive weights obtained after 1 hour heating intervals following an initial drying of at least 6 hours. The weighing bottle and its contents are allowed to cool in a dessicator for 30 minutes and then weighed.

The alpha-cellulose yield is calculated on the oven-dry weight of the material. Duplicate 3-gram samples for moisture determination should be weighed out at the same time that the samples for the alpha-cellulose determination are taken.

Notes on Method

(1) Preparation of Sodium Hydroxide Solution. The sodium hydroxide solution is prepared by dissolving sticks of alkali in an equal weight of water, and allowing it to stand 10 days for the sodium carbonate and impurities to settle. The clear, supernatant liquid is decanted and diluted with carbon dioxide-free water until its density at 15°C. is 1,197. Such a solution contains 17.5 ± 0.1 grams of sodium hydroxide per 100 grams of solution.

(2) Time Interval for Steps in the Procedure. An interval of 15 minutes should elapse between the times of starting the alkali treatment of the individual triplicate samples. Such a procedure allows time before proceeding to the next sample in the triplicate determination for the various steps in the procedure, such as impregnation, maceration, filtration, and partial washing.

If 5 minutes are allowed between the addition of a part of the alkali and the beginning of maceration, it will be found that sulfite pulp swells to five or six times its original volume, and the fibers can be much more easily macerated. The remaining 10-minute interval, during which the remaining 40-cc. portion of the alkali is added, making a total of 75 cc., has been found ample time for maceration of pulps. With such a scheme, for example, one would add the alkali to the samples at 9:00 o'clock, 9:15, and 9:30, respectively. Filtering would begin at 9:45 o'clock, 10:00, and 10:15, respectively.

(3) Filtering Medium. Jena glass filter crucibles (coarse) may be used in place of the Gooch crucibles specified in the directions.

(4) Testing for Acidity. To test the acidity of the wash water on litmus paper, the last few drops removed after the addition of water should be used. This tentative standard method, it is hoped, will receive the careful consideration of the Technical Association members interested in the alpha-cellulose determination.

The activities of other committees of the Cellulose Division of the A. C. S. include the investigation of the copper number test, furfural determination for pentosans, oxidized cellulose and standard cellulose. Several papers on these subjects have recently been presented at Divisional meetings,[7] which usually occur at the time of the semi-annual meetings of the American Chemical Society.

Besides the committee work of the Cellulose Division, there are numerous other contributions covering all phases of cellulose chemistry, both pure and applied. During the past year the following papers were listed on the two programs of the Division and serve to illustrate the diversified interests of its members.

The Structure of Mercerized Ramie Fibers, by O. L. Sponsler and W. H. Dore; X-ray Methods used in Determining Structure of Cellulose Fibers by O. L. Sponsler;[7] what the X-ray Tells Us of the Structure of Cellulose, by Ernest A. Hauser.[8] The Action of Alkali on Cellulose by G. W. Blanco.[9]

The Manufacture of Cellulose Sausage Casings, by W. F. Henderson;[11]

Isolation and Properties of Lignin, by H. Hibbert;

Cellulose from Cereal Straws, by S. D. Wells;

Cellulose from Flax Straw, by E. R. Schafer and Mark W. Bray;

Cellulose from Cornstalks, by O. R. Sweeney;

Cellulose from Wood, by L. F. Hawley;

Cellulose for the Manufacture of Smokeless Powder, by Fred Olsen;

The Destructive Distillation of Lignin from Corn Cobs, by Max Phillips.

Analytical

Determination of Cellulose and Amount of Chlorine Consumed in Its Isolation, by Mark W. Bray;[12]

Report of Alpha-Cellulose Committee, by G. J. Ritter;[6]

Dissection of Wood Fibers by Chemical Means, by G. J. Ritter;

The Dissection of Wood Fibrils by Chemical Means, by G. J. Ritter;

Freeness Testing as an Aid in Pulp Evaluation, by D. S. Davis.[13]

Wood

Chemical Studies on Pulping of Spruce Wood. 1—Effect of Temperature on Rate of Hydrolysis with Sodium Hydroxide, by Mark W. Bray;

The Acetylation of Aspen Wood, by L. C. Fleck;

The Occurrence of Pinite in Redwood, by E. C. Sherrard and E. F. Kurth;[14]

The Tannin Content of Mountain Hemlock, by E. C. Sherrard and P. B. Davidson;

The Analysis of Wood Rays in Two Hardwoods, by L. E. Wise and W. M. Harlow;[15]

Sequoyite—A Cyclose from Redwood, by E. C. Sherrard and E. F. Kurth.

The officers of the Cellulose Division of the American Chemical Society desire to extend a very cordial invitation to Technical Association members to attend the next meeting of the Division which will occur during the spring meeting of the Society, April 30—May 3, at Columbus, Ohio.

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Sale of Paper Mill Postponed

[FROM OUR REGULAR CORRESPONDENT]

Denver, Col., May 9, 1929.—The sale of the Colorado Pulp and Paper Company which was scheduled for May 7 was postponed by Receiver George W. Beck. The plant is operating and it is understood that the postponement of the auction is due to the fact that some parties are dickering to purchase the entire business.

The Colorado Supreme Court refused to rehear the case of Myers vs. Buchhalter, in which it overruled the lower court and canceled a written contract made by Charles B. Myers, the originator of the mill and Joseph Buchhalter who together with Myers purchased the property when it first went into receivership.

Survey of Chemistry of Lignin*

By Emil Heuser[1]

Although the chemistry of plants and that of their chief constituents has been subject to research for more than one hundred years, investigations on cellulose and on lignin in a more systematic way did not start earlier than about thirty years ago. But only slow development is to be seen during this period of research, especially as far as lignin is concerned.

An essentially new impulse, however, may be noted from the year 1913 on when Willstaetter and Zechmeister published a new method for isolating the lignin from wood, consisting of a treatment of wood meal with highly concentrated hydrochloric acid at a low temperature whereby all cellulose and most of the other carbohydrates are dissolved, leaving the lignin as residue. This method, if applied with certain precautions, yields the same amount of lignin as theoretically estimated by Klason a long time ago on the basis of the interaction of sulphite liquor with wood. Consequently, it is also a method for analytical determination of lignin in ligneous raw materials.

The importance of this fortunate discovery has to be assigned to the fact that in this way the lignin, for the first time, had been rendered easily accessible for thorough investigation and, furthermore, that it apparently, is only slightly changed from a chemical point of view.

All chemical experiments on lignin are finally shown to have one aim, namely to clear up the constitution of this still rather mysterious substance. For, having recognized its structural formula, we will be able to throw more light not only upon the chemistry of plant life but also upon all those technical processes where lignin plays an essential part. We will be able to correct these processes where lack of knowledge and of recognition had put us on the wrong track and, finally, we will be better aided to succeed in finding ways for utilizing the lignin—be it in the wood itself or be it a waste product as in the sulphite waste liquor—by converting it by means of chemical methods into valuable industrial products.

Whatever process is used such as methylation, acetylation, sulphonation or oxidation, reduction and so forth, all experiments applying these and other classic methods of organic chemistry aim at the recognition of the true nature of the lignin.

In order to obtain from a chemical point of view a picture of what lignin appears to be today it seems to be advisable to follow up the more recent results gained by using those different methods. These results may be regarded as the mosaic tiles which we have to put together in order to obtain the picture of the lignin's constitution.

We will see, however, that a good many of those stones are still missing so that we do not yet know whether the picture we can make up so far is likely to be correct or not.

Isolation of Lignin

Before Willstaetter and Zechmeister had developed the method of isolation by means of hydrochloric acid, other inorganic acids, especially sulphuric acid as first suggested by Klason and then modified by I. Koenig and his collaborators, have been used. New modifications as worked out by L. Paloheimo[2] recently, do not change the fact that the sulphuric acid method is not as suitable as Willstaetter's procedure. Only with regard to the conversion of cellulose into sugar, Paloheimo's modification apparently means an improvement, since he claims that his method gives the theoretical yield of sugar.

The hydrochloric acid method has been modified too in different ways, all aiming at a less severe treatment in order to avoid essential changes of the lignin produced.

Freudenberg and Urban[3] use an addition of phosphoric acid, Kuerschner[4] divided up the treatment with hydrochloric acid into a series of shorter periods, Kalb and collaborators[5] apply a two stage treatment and extract the product after the first stage with cuprammonium solution, thus obtaining carbohydrate-free lignin, which does not show any change in the methoxy content or in other characteristics of the genuine lignin.

A further modification for isolation has been discovered by Friedrich[6] who reduced the hydrochloric acid to a small amount only, by using concentrated acetic acid as main reagent adding 3 per cent of hydrochloric acid. In this way at approximately 100 deg. C. the lignin is acetylated and dissolved and may be obtained in solid form by precipitation with water. By treating it with very dilute caustic soda solution the acetyl groups are saponified. Also mixtures of acetone and of chloroform with hydrochloric acid are suitable to remove the lignin from the wood, but seem to yield less homogenous products than acetic acid plus hydrochloric acid.

With Friedrich's method of isolating the lignin are those in close relation which use mixtures of alcohols, poly-alcohols and the like with small amounts of hydrochloric acid. These alcohols, in the same way as the acetic acid, react with certain, though different, groups of the lignin, thus facilitating the lignin's removal from the wood, on the other hand yielding in the first step, a lignin derivative which sometimes cannot be reversibly converted into the unchanged substance. These methods, therefore, will be considered in another part of this paper.

Dilute hydrochloric acid instead of the highly concentrated acid is used by Gruess[7] who in this way isolated his so-called primary lignin which later on served Friedrich and collaborators for further studies.

It is an old idea to gain the lignin from the wood by an entirely different method namely by utilizing the activity of certain bacteria which consume cellulose and other carbohydrates leaving the lignin untouched. Much development is shown along this line within the last few years. Although most of the chemists who used this method claim that the lignin produced in this way cannot be separated sufficiently from the other wood constituents or has more or less changed its properties[8] Falck, Professor of Mycology with his collaborators[9] obviously has obtained more encouraging results. Some kinds of destructive fungi, especially Merulius, eliminate the cellulose completely and a great deal of other carbohydrates from the wood, thus leaving a lignin product which apparently has not essentially changed its properties. Still better results were obtained by Falck[10] on straw by means of certain thermophilic bacteria whereby, besides the cellulose, also all pentosans are destroyed. The lignin thereby does not change its methoxy content.

A lignin produced in this way where all more or less violent chemical interactions are eliminated might become a very suitable product for studying the properties of the genuine lignin as it exists in the wood.

The isolation of lignin from sulphite waste liquor or sulphate black liquors[11] has shown very little progress during the last few

* Paper presented at the Annual Meeting of TAPPI, New York, Feb. 19, 1929.

[1] Member TAPPI, Manager Research Dept. Canadian International Paper Co., Ltd., Hawkesburg, Ont.

[2] Paloheimo. Cellulosechemie 9:35 (1928)
[3] Freudenberg and Urban. Ibid. 7:23 (1926)
[4] K. Kuerschner. Chemie der Ligninkoerper. Stuttgart, 1925.
[5] Kalb and collaborators, Ber. Deutsche Chem. Ges. 61:1007 (1928)
[6] A. Freidrich, Zeitschrift f. physiolog. Chemie 176:127 (1928)
[7] Gruess, Berichte Deutsche Botan. Ges. 38:361 (1921) see also Lieser Cellulosechemie 7:156 (1926)
[8] Kuerschner, Cellulosechemie 8:5 (1927)
Hawley, Fleck and Richards, Ind. eng. chem. 20:504 (1928)
Schwalbe and af Ekenstam, Cellulosechemie 8:13 (1927)
[9] Falck and Haag, Ber. Deutsche Chem. Ges. 60:225 (1927)
[10] Falck, Cellulosechemie 9:1 (1928)
[11] Haegglund, Cellulosechemie 5:81 (1924). Holmberg, Ber. Deutsche Chem. Ges. 54:2417 (1921).

years if we, for the moment, exclude those methods which again involve a certain interaction between the lignosulphonic acid and the chemical agents of isolation. Those methods will be dealt with later on. Rather much research, however, has been done on isolating of the lignin by extracting lignous raw materials with alkalis (Alkali-lignin). Beckmann and Liesche's work[22] has been extended by Powell and Whittaker.[23] Since the lignin obtained in this way seems to be different from the hydrochloric or the sulphite lignin, I will defer consideration of it for the present.

The External Groups of the Lignin

Lignin is characterized by a series of clearly defined groups linked with a rather mysterious nucleus. These groups are known to us as methoxyl, acetyl and hydroxyl groups while the existence of an aldehyde group and an unsaturated linkage is quite probable.

Whilst the presence of *methoxyl groups* in the lignin can be easily proven, it is difficult to identify *acetyl groups* which are supposed to be characteristic of the genuine lignin, since acetic acid appears only when isolating the lignin from the wood by the acid methods and, consequently, pentosans or other carbohydrates might be the source too. Hydrochloric acid lignin does not contain any acetyl group. Some of the lignin chemists believe that the acetyl radical is linked with the lignin in a "half-acetal" form, and that by hydrolysis (HCl) acetic acid is split off whereby a carbonyl function is formed[24]:

$$R = \underset{\displaystyle OH}{\overset{|}{C}} - O.CO.CH_3 \rightarrow R = C = O + CH_3COOH$$

It is easier to identify the presence of *hydroxyl groups* in the lignin. This has been done by methylation, acetylation and benzoylation as well as by some other reactions.

There is no doubt that the methoxyl groups introduced into the lignin in the usual way are linked to groups of the lignin itself[25] and that the increased methoxy content is not, as has been claimed[26], due to carbohydrates, which originate from the lignin's isolation.

On the other hand, the method of methylation has been improved and higher values for CH_3O have been thus obtained (32%).[27] When applied to the wood itself cellulose and other carbohydrates are methylated too at the same time, but hydrolysis leads to separation of the methylated constituents.[28]

Another proof of the presence of hydroxyl groups is to be found in the fact that lignin may be *acetylated*. The usual way of introducing acetyls[29] into hydrochloric lignin has been applied also to wood again with the idea of separating the esterified substances by hydrolysis, this time apparently not with complete success.[30]

Bensoyls too have been introduced. They combine with the so-called primary lignin[31] to give a tribenzoate, and with lignosulphonic acid.[32] The first benzoylation was carried out on calcium salt of lignosulphonic acid by Klason.

The interaction of *Toluene-sulphonic chloride* leads to an ester, thus also indicating the presence of hydroxyl groups.[33]

There has always been much evidence for the presence of *carbonyl groups* in the lignin, and the last few years have brought out a series of very interesting facts along this line. It is known that P. Klason derived from his studies on the sulphite cooking process the assumption that one part of the sulphurous acid (or its calcium salt) combines with an aldehyde group of the lignin. According to the theory on the well known reaction between plain aldehydes and bisulphites, the product of reaction had to be regarded as a sulphurous acid ester of the aldehyde in which sulphur is combined with carbon by means of oxygen as shown in the following equation:

$$R = \underset{\displaystyle O}{\overset{\|}{C}} - H + NaO - \underset{\displaystyle O}{\overset{|}{S}}O \rightarrow R.\underset{\displaystyle H}{\overset{|}{\underset{\displaystyle OH}{\overset{|}{C}}}} - OSO_2Na$$

Such a compound is unstable and, in fact, the bisulphite-aldehyde residue's compounds are split off easily. The same constitution has been ascribed to the lignin bisulphite compound.[34] This opinion, however, has changed. Already about one year ago Hibbert[35] has reported on these compounds as sulphonic acids, contrary to the generally accepted theory mentioned before. Then, the application of a modern method for studying problems of constitution, namely by evaluating the Roentgen absorption spectrum, has verified this statement. Stelling[36] has proved the constitution of the compound in question to be that of a hydroxy-sulphonic acid with the sulphur linked directly with the carbon of the aldehyde group:

$$R.\underset{\displaystyle H}{\overset{|}{\underset{\displaystyle OH}{\overset{|}{C}}}} - SO_2Na$$

Contrary to the normal sulphonic acids the hydroxy derivative is unstable, very likely due to the influence of the hydroxy function (...schig).

We may then assume that the addition of one molecule of bisulphite which indicates the presence of an aldehyde group takes place in the same way with the lignin. The constitution of this part of lignosulphonic acid would be in accordance with the known fact that one part of the bisulphite, combined with the lignin, may be easily split off by means of acids and alkalis.

It might be advisable to consider, in this connection, another function assumed to be characteristic of the lignin, before discussing further proofs for the presence of the aldehyde group.

This function is that of an unsaturated compound with a double linkage known as *ethylenic linkage*.

Also, in this case Klason was the first to direct attention to the fact that another part of the bisulphite is combined very firmly with lignin and that this part very likely is added to one of the double linked carbon atoms. He therefore, believes that in the genuine lignin the aldehyde group and ethylenic linkage are combined to form an acrolein group.

$$R.CH = CH.\underset{\displaystyle O}{\overset{\|}{C}} - H$$

In the lignosulphonic acid it has taken up two molecules of bisulphite, one of them combined only loosely with the aldehyde group in the form of an alpha-hydroxy-sulphonic acid and the other attached very firmly to the double linkage in the normal way.

That the presence of a double linkage is very probable is further shown on the *addition of halogens* which takes place very rapidly, for instance with chlorine or iodine[37] (up to 63% Iodine is taken up).

Also the interesting phenomenon of *autoxidation* which lignin shows in alkaline solution[38] indicates the existence of a double linkage.

The reaction between bisulphites or sulphurous acid and the aldehyde group have also been studied on plain aldehydes of the aliphatic and the aromatic series in order to find parallels with the reaction on lignin.

Hibbert[39] has reported on experiments carried out with saturated and unsaturated aldehydes (as croton-aldehyde (CH_3-CH : CH. CHO) and cinnamic aldehyde (C_6H_5. CH : CH. CHO))

[22] Beckmann and Liesche. Zeitschr. Angew. Chemie 34:285 (1921).
[23] Journ. Chem. Soc. (London) 125:357 (1924).
[24] Jonas, Wochenbl. Papierfabr. 1925 No. 24A.
[25] Heuser, Schmidt and Gunckel, Cellulosechemie 2:82 (1921)
[26] Jonas, loc. cit.
[27] Urban and Freudenberg Cellulosechemie 7:73 (1926).
[28] Urban, loc. cit.
[29] Heuser and Ackermann, Cellulosechemie 5:13 (1924)
[30] W. Fuchs, Ber. Deutsche Chem. Ges. 61:948 (1928).
[31] Freidrich and Diwald, Monatshefte Chemie 46:31 (1925)
[32] Doree and Hall, Journ. Soc. Chem. Ind. 43:257 (1924).
[33] Urban and Freudenberg loc. cit. and Freudenberg and Hess, Liebigs Ann. 448:121 (1926)
[34] Jonas, Papierfabrikant 26:222 (1928)
[35] H. Hibbert, Proc. and Transact. Can. Pulp and Paper Assn. 1927-28, page 39
[36] Stelling, Cellulosechemie 9:100 (1928)
[37] Wedekind and Garre, Zeitscher. Angew. Chemie 41:107 (1927).
[38] Franz, Fischer, Schrader and Treibs, Abhandlungen zur Kenntnis der Kohle 5:221 (1922) and 6:1 (1923).
[39] H. Hibbert, loc. cit. and ibid 1928-29.

and has shown that their compounds with sulphurous acid are very strong acids.

As the *formation of acetals* by the action of alcohols is also characteristic for the presence of aldehyde functions, this reaction too has been studied with lignin, both with hydrochloric acid lignin and with lignosulphonic acid as well as with the wood itself.

The reaction on wood using ethylalcohol with addition of small amounts of acid (HCl) may be considered as "alcoholysis,"[30] the first stage being hydrolysis which liberates the lignin which then with its aldehyde function combines with the alcohol to form an acetal:

$$R.CH=CH.\overset{\overset{O}{\|}}{C}-H + 2C_2H_5OH \rightarrow H_2O + R.CH=CH.\overset{\overset{O.C_2H_5}{|}}{\underset{\underset{H}{|}}{C}}-O.C_2H_5$$

Friedrich and Divald[31] who applied a similar method with the idea of isolating the lignin did not at first recognize that alcohol groups had entered the product. Haegglund and Urban and Haegglund and Rosenquist[32] have celared up this recation as alcoholysis in Holmberg's sense which, besides, takes place with a series of other alcohols such as amyl and butyl alcohol.

Isolated lignin reacts in the same way.[33] Instead of these alcohols Hibbert used polyalcohols such as glycol (and later glycerol chlorhydrin and glycerol alone) with traces of iodine or hydrochloric acid, on wood in order to obtain a lignin product which is supposed not to have changed its genuine properties.[34] Whether, in this way, glycol groups too combine with the lignin has not been reported, but seems to be very probable.

Consequently, all alcoholytic methods do not permit of isolating the genuine lignin as such but result in derivatives (see "isolation of the lignin"), in acetals or half-acetals which cannot be split off without decomposing the components.

It is well known that lignin can be isolated by the action of phenols in the presence of acid on wood. This process has been modified in different directions during the last few years,[35] partly with the idea of applying this reaction as a technical process for producing wood pulp, partly from a pure science point of view.

With regard to the latter, there seems to be no doubt that phenol and all of its derivatives investigated react in the same way as alcohols, that means condense, with their alcoholic groups, with the aldehyde function of the lignin to give acetals.[36] Consequently, the opinion that one of the *hydrogens* of the phenol might react so as to give a hydroxy-phenyl-derivative.[37]

$$R.\overset{\overset{O}{\|}}{C}-H + H.C_6H_4OH \rightarrow R.\overset{\overset{OH}{|}}{\underset{\underset{H}{|}}{C}}-C_6H_4OH$$

very likely has to be abandoned, since phenol ethers in which the hydroxyl is occupied, do not react at all with lignin.[38]

The presence of aldehyde groups in the lignin seems to be indicated also by the *action of naphthylamine* on lignin and lignosulphonic acid.

This very interesting reaction has been first studied by P. Klason and has served him to isolate the lignin from the sulphite waste liquor. In this way he was able to separate the lignosulphonic acids dissolved in the waste liquor, into two parts called alpha-and beta-lignin (sulphonic acid respectively) the alpha-compound being precipitated by the naphthylamine whilst the beta-form remains in solution.

There has been much discussion on how the amine might react with the lignin. Has the compound to be considered as amine salt of the lignosulphonic acid, with the amine radical linked with the sulphonic acid function, or do the results of investigation point to the compound as being free sulphonic acid formed by reaction between the amine group of the naphthylamine and the aldehyde function of the lignin?[39] Most of the results, in fact, are in favour of the latter theory,[40] and the compound in question would have the following structure:

$$R.CH_2.CH.SO_2OH.CH = N.C_{10}H_7$$

In order to perform the reaction in this way the aldehyde function, of course, must react as a free carbonyl group liberated from the sulphite which has been added to form the sulphonic acid. Since this sulphite molecule is only loosely combined, acids or alkalis will easily split it off.

Finally, *phenylhydrazine* acts on lignin so as to give proof of the presence of aldehyde groups, because the product of reaction appears to behave like a phenylhydrazone.[41] This reaction, however, apparently demands further study.

With regard to other external groups to be found in the lignin it is important to point out that there is no indication for the presence of a *carboxyl function.*

Reactions to Clear Up the Nature of the Nucleus of the Lignin

Whereas, thus, it is comparatively easy to obtain an approximate idea of the lignin's external groups which, if this picture is allowed, only decorate the nucleus, serious difficulties of all kinds arise when one comes to the next step which is to unravel the true nature of this nucleus.

Unfortunately, organic chemistry does not yet possess very suitable methods for clearing up the constitution of such complicated compounds as produced by nature in the plant, and our experimental technique is confined to rather rough and violent processes such as dry distillation, fusion with alkalis and the like.

These processes mostly split off the original compound into parts which are to be considered already as final products of reaction or which represent products of interaction between them and less parted compounds. Very little, then, may be concluded from these results.

On the other hand it has to be admitted that there are ways and means to make these processes less severe, for instance by applying vacuum conditions, by replacing the oxydizing atmosphere by other gases or by interrupting the processes at a stage where less parted compounds may be extracted.

Almost all experimentors who used the methods mentioned, and other processes, have tried to apply this idea; but even then the conclusions have to be drawn with much care and reserve.

Two of those methods which we are able to apply in either a violent or in a lenient manner just as well are *oxydation* and *reduction.*

In the case of lignin, however, the lenient treatment does not very much respond as far as the nucleus is concerned, and the violent one is too destructive.

Oxidation of lignin leads to almost nothing else but oxalic acid which is not very interesting, because it shows that the whole nucleus has been destroyed.

Having in mind the fact that aromatic compounds such as phenols and derivatives may be stabilized by converting their hydroxls into methoxyls or the like so as to give acids with the aromatic nucleus maintained, it was thought possible to convert methylated lignin, by oxydation, into acids of aromatic nature.[42] But also this attempt to throw some light on the nucleus had no success. On the other hand, this result is capable of making one a little suspicious whether the nucleus has anything to do with aromatic compounds.

But let us first, though briefly, consider simply the results of other processes before discussing the conclusions as to the nucleus constitution.

Oxidation of lignin in presence of alkali under pressure as worked out by Franz Fischer and his collaborators[43] leads to

[30] Holmberg and Runius, Svensk kemisk tidskr. 37:189 (1925)
[31] Friedrich and Diwald, Monatshefte Chemie 46:31 (1925).
[32] Haegglund and Urban, Cellulosechemie 8:69 (1927).
[33] Haegglund and Urban ibid 9:49 (1928).
Haegglund and Rosenquist. Biochem. Zeitscher. 179:381 (1926)
[34] H. Hibbert, loc. cit.
[35] Herzog and Hillmer, Cellulosechemie 6:169 (1925).
[36] Haegglund and Johnson. Biochem. Zeitscher. 187:117 (1927).
[37] Jonas, Wochenbl. Papierfabr. 1925 No. 24A.
[38] Herzog and Hilmer, loc. cit., Haegglund and Johnson, loc. cit.
[39] See Haegglund, Holzschemie, Leipzig, 1928, page 109.
[40] Haegglund, Cellulosechemie 6:29 (1925).
[41] Dorée and Hall. Journ. of the Soc. Chem. Ind. 43:257 (1924).
Friedrich and Diwald, loc. cit.
[42] Heuser and Samuelson, Cellulosechemie 3:78 (1922).
[43] See Fuchs, Chemie des Lignins, Berlin, 1926, page 111.

about 8% aliphatic and 11% Benzene carboxylic acids, the formation of the latter being characteristic of the lignin because they are not formed from cellulose exposed to the same treatment.

The same differentiation between lignin and cellulose is possible by fusing with alkali at higher temperature. It is known that in this way lignin forms protocatechuic acid and pyrocatechol, whereas cellulose yields none of these substances.[44]

Reduction of lignin by a very severe treatment with hydriodic acid[45] leads to a very complicated mixture of polycyclic hydrogenated hydrocarbons, a result which does not, in my opinion, allow us to draw conclusions as to the nature of the lignin because cellulose, hexoses and pentoses yield the same hydrocarbons, and the fact that lignin and cellulose are different substances scarcely will be denied.

Dry distillation of lignin, carried out already many years ago, has again been subject to investigation but the results have not widened our knowledge very much.[46]

Of greater interest seems to be the result obtained by repeating the destructive distillation of lignin in the presence of stannous chloride by which Czapek, about 40 years ago, obtained an apparently aromatic substance of characteristic properties to which he gave the name "hadromal." The constitution of this product is now shown to be that of coniferyl-aldehyde,[47] which can be synthesized by the action of acetaldehyde on vanillin. The product of this reaction is identical with hadromal. These results are again of importance, in view of the question whether the lignin's nucleus is considered to be aromatic or not.

On the other hand, Hoffmeister believes that hadromal is to be found in the wood only in small amounts (3% of the wood). In this case his result would not have a direct bearing on the nature of the lignin's nucleus. This, however, remains to be seen. In any case, with these results, those obtaiend by Kuerschner,[48] who by sublimation of the lignin, obtained vanillin, gain new significance. It appears to be possible that Kuerschner's vanillin, obtained by means of sublimation, originates also from compounds which only in small amounts are met with in the wood because Kuerschner's high yield figures are claimed to be not nearly as high as reported.[49]

Since we know that coniferin is to be found in small amounts in the wood's cambium and yields by hydrolysis glucose and coniferylalcohol, coniferin might be the source of both hadromal and vanillin, both being products of oxidation of coniferylalcohol.

Further research is required to elucidate these questions.

Theories on the Constitution of the Lignin

For some years the question of how the lignin in the wood is combined with cellulose and other carbohydrates has been discussed rather violently. One wants to know whether it is combined chemically or mechanically with the carbohydrates. Many results have been collected in order to support the "chemical" theory. This is chiefly represented by Haegglund. There are mainly two reactions which he claims to prove the lignin to be chemically combined with the carbohydrates (of which he chiefly has in mind the pentosans). The one concerns the action of alcohols and phenols in presence of acids on lignin the so-called "alcholysis." Haegglund believes that the ethoxyls (and phenol radicals) can enter the lignin in the wood only by substituting carbohydrate radicals, in other words, by exchanging them for ethoxyls. At the moment hydrolysis loosens the linkage between lignin and carbohydrates, the aldehyde group is set free and reacts with the ethoxyls to form an acetal.

This sounds rather plausible but is only a theory and not to be considered as proof.

On the other hand, Friedrich[50] has shown that the entrance of ethoxyls into the lignin in the wood almost alone depends on the length of time the wood is exposed to the alcohol, and is therefore characterized as a secondary and not an instantaneous reaction.

The other argument in favour of a chemical combination is the fact that the methylated carbohydrates which, outside the wood, are soluble in chloroform, cannot be extracted by means of this solvent from the methylated wood.[51] This fact, indeed, would be in favour of a chemical combination between the two constituents.

Klason's theory, which is now more than 20 years old and on which the venerable and meritorious pioneer of the chemistry of lignin is still incessantly working—makes *coniferylaldehyde* the elementary body of the lignin.

Although the absolute proof of this theory is still lacking, a series of facts are capable of supporting the theory to a great extent.

In this connection the results of very recent research are very interesting.

Klason succeeded in synthesizing coniferylaldehyde-hydro-sulphonic acid and in identifying the naphthylamine derivative of this substance as being very similar to the napthylamine compound of the lignosulphonic acid from sulphite waste liquor. Klason claims that the only difference between the two substances is that the synthesized product is monomolecular, whereas in the lignin derivative coniferylaldehyde exists as a product of polymerisation.

Klason believes that during the sulphite cooking process the polymerized coniferylaldehyde derivative, i. e. the lignin, is depolymerized to the plain monomolecular coniferylaldehyde, analogous to the depolymerisation of cellulose into glucose. Both processes take place under the influence of acids.[52]

In opposition to Klason's coniferylaldehyde theory are those which make furane

the elementary body of the lignin. This theory in different modifications is so represented especially by Jonas,[53] and by Schrauth[54] and is based on the assumption that the plant builds up the lignin from anhydrides of hexoses. The intermediate product is supposed to be hydroxy-methyl-furfural. Jonas means it is safe to believe that the structure of the lignin is characterized by very resistant oxygen rings as found in hydrated furane rings, for instance in the butylene oxide. In his newest formula 3 hydrated furane rings are condensed with one cyclohexane and 3 cyclohexene rings. This picture is very similar to that given by Schrauth.

There is, however, no proof of this theory either, and the number of facts is rather small compared with those which suport Klason's theory. Results which might support it, as for instance those of a condensation of furane with simple sugars which is supposed to yield lignin-like substances,[55] have not yet been published in detail giving all data and figures. But besides this, many more experimental facts are necessary in order to take the furane theory out of the realm of speculation and to put it on a sound basis.

The length of this paper will prevent me from discussing also those theories which concern tne formation of lignin in the plant and those which try to clear up the relationship between the death of plants and the formation of coal.

On the other hand, it seems to be just as good to postpone such discussion for a year or more as it, then, very likely will be easier to obtain a truer picture than possible today.

[44] Heuser and Herrmann, Cellulosechemie 5:1 (1924).
[45] Willstaetter and Kalb, Berichte Deutsche Chem. Ges. 55:263 (1927).
[46] Fuchs, Berichte Deutsche Chem. Ges. 60:957 and 1327 (1927).
[47] Hoffmeister, Berichte Deutsche Chem. Ges. 60:2062 (1927).
[48] Kuerschner, Zur Chemie der Ligninkoerper. Stuttgart, 1925, page 77.
[49] Haegglund and Rosenquist, Biochem. Zeitschur. 179:376 (1926). Routala and Seven, Cellulosechemie 8:115 (1927). Jonas, Papierfabrikant 26:221 (1928).
[50] A. Friedrich, Zeitschr. F. Physiol. Chemie 176:127 (1928).
[51] Urban and Freudenberg, loc. cit. Freudenberg and Hess, loc. cit.
[52] Klason, Ber. Deutsche Chem. Ges. 58:1761 (1925), Ber. 61:171 (1928). Papierfabr. 26:208 (1928)
[53] Jonas, Papierfabrikant 26:221 (1928).
[54] Schrauth and Quassebarth, Ber. Deutsche Chem. Ges. 57:854 (1924).
[55] Jonas Zeitschr. f. Angew. Chemie 36:596 (1923).

Corrosion Resistant Steels for the Industry*

By John A. Matthews[1]

The speaker makes no claim to being an expert in paper technology and assumes that for the most part his audience is not made up of those of great metallurgical erudition. It is hoped that we can use a common language for a few minutes to consider matters in which we are mutually interested.

The subject of corrosion has always been of tremendous importance to industry. The question of correcting or preventing it by means of various alloy steels is of much more recent date and even yet industry as a whole does not seem to grasp the possibilities now offered through the wide variety of alloy steels possessing very remarkable properties. Strangely enough, nitric acid, weak or strong, is about the easiest chemical to handle since the straight chromium steels, with sufficiently high chromium, are all but perfectly resistant to that acid, whether hot or cold. As you know, nitric acid formerly has always been shipped in glass containers. It is now possible to ship it in metal containers and even tank cars have been built for the purpose. In your industry some of the so-called weak acids and compositions seem to present difficulties which we would ordinarily not expect.

Laboratory Tests

For ten years or more we have been making laboratory tests with hundreds of chemicals, either pure or mixed, in regard to their effect on different alloy steels. In these tests the effects of concentration and temperature have been considered and altogether a very great amount of data has been accumulated. Much of this has now been supplemented by industrial applications but even yet in many cases a practical test of the material under working conditions is necessary before an intelligent adoption of these materials can be made for specific duties. This does not mean that every composition or product on the market need be selected for laboratory tests, for practical experience is now sufficient to give us a reasonable expectancy of making a successful selection or possibly a choice between two or three compositions which may have to be submitted to practical tests. In your study of figures which may be reported regarding loss due to the action of chemicals on these alloys, it should be pointed out that choice of materials may require consideration of two different phases of the question. First, the mere question of loss of weight indicates the relative life which may be expected. Second, the question must be considered as to whether the dissolved material will prove detrimental to the process or product; also in considering the question of loss in weight it is well to recall that losses due to total immersion tests may be from two to three times as great as the actual losses would be if, for example, the metal were used as a containing vessel, for the simple reason that in the test it is attacked on all sides, while in the containing vessel it would be attacked on one surface only in most cases. There are also applications in which the two sides of a metal may be subject to different forms of attack, as for example, high temperature and the products of combustion on one side and process materials on the other side.

Beater Bars

As illustrating the type of application where both wear and the effects of products of wear or solution must be considered, we might cite beater bars in the production of certain kinds of pulp in which an extremely low amount of copper and iron is desirable. For such a purpose bars made of stainless iron seem to have made a very good record for themselves for both reasons. Their wear resistance has been satisfactory and they contribute a minimum of iron to the product, and of course no copper. They are therefore superior for this purpose to bars made of ordinary steel or bronze. These bars are furnished in a condition which permits punching or machining and yet of a hardness to give very excellent life.

Chromium Alloys

Before going further into the matter of specific tests or specific steels for various purposes, let us review briefly the types of corrosion resistant steels now available. These may, in general, be divided into two classes. First, the chrome-iron alloys, and second, the austenitic chrome-nickel alloys, with or without various other added elements, such as silicon, copper, molybdenum, etc. The first group of chromium alloys is also divided into two classes: (a) Those usually containing from 10.0 to 15.0 per cent of chromium, known as stainless iron or stainless steel. This group responds to heat treatment in exactly the same way as the ordinary engineering alloy steels. They may be hardened and tempered to show very high mechanical strength, (b) Chromium alloys containing above 16 per cent and up to about 28 per cent chromium do not respond to normal heat treatment and may not be hardened by quenching. These are frequently referred to as "chrome-irons". Metallurgically speaking, the products known in the trade as stainless iron, stainless steel or chrome-iron, are in fact all steels, but the descriptive names assigned to these products are useful for distinguishing them from one another. The second group, or the austenitic chrome-nickel steels are in many characteristics entirely different from any steel with which you have had experience. They may not be hardened by quenching but on the other hand are softened and they are entirely non-magnetic. The only way they may be hardened is by mechanical working or cold working, which serves to harden and strengthen them very materially but of course with a corresponding decrease in ductility and impact resistance. This brief outline is all that is necessary for the present occasion as these steels have been described very fully in other places.

The chromium-nickel alloys seem to have originated at the Krupp Works during the war and at the same period the company with which I am associated began the investigation of similar products, but in addition to chromium and nickel they were also characterized by a substantial silicon content. This confers some additional advantages since it specifically facilitates the welding process and also improves resistance to oxidation and scaling, at high temperatures, which has become one of the important applications of these products. The steels developed by this company are called "Rezistals" because of their extraordinary resistance to many kinds of chemical attacks, to scaling, to magnetizing and to the passing of an electric current. One of these steels carries approximately 18.5 per cent nickel, 9 per cent chromium and silicon up to 2½ per cent—depending upon the specific purpose to which it is to be put. This grade will be referred to later in connection with some of our tests. Another grade contains approximately 18 per cent chromium, while another contains from 24 to 27 per cent chromium.

Effects of Sulphurous Acid

One of the corrosive chemicals largely used in your industry is sulphur dioxide or sulphurous acid and some information in regard to the effect of these upon the corrosion resistant steels may be of interest. We have cooperated with two progressive manufacturers who have carried on very extensive experiments with quite a variety of products in connection with sulphite digestors. We have had the privilege of examining the results obtained and they are of great interest and importance, not only the successes but the failures, for they give us a basis for some

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general conclusions which remove much of the uncertainty that existed in the industry only a year or two ago. Each of the companies referred to has tested upward of twenty different alloys, some of them non-ferrous or metals of the non-ferrous groups, and in addition to this have been included various ferrous alloys of the types just described, and others. These specimens were subjected to total immersion tests in the digester for varying lengths of time—from ten to over one hundred cooks or from one hundred fifty to twenty eight hundred hours. The results of these experiments show that the non-ferrous metals, as a class, so far as yet tested, are unsatisfactory and by no means equal to several of the ferrous alloys. They show that some of the ferrous alloys that have been submitted from time to time are unsatisfactory but of the ferrous alloys submitted, the range of analyses covered shows conclusively that a high chromium content, such as a stainless steel of 24 per cent chromium is extremely resistant. They further show that a high chromium content with relatively low nickel is also satisfactory. They also show that where the nickel is much higher than the chromium, the results are not satisfactory.

Corrosion Tests

The two reports referred to, give their results in different forms. One gives a loss in weight in "grams per square inch" and the other in terms of percentage loss based on total weight. It is therefore difficult to compare the results of the two tests and this brings to our attention the fact that there is so far no standard method of reporting corrosion resistance data. The method of reporting percentage loss is not satisfactory unless all samples tested are of the same proportion, for obviously the same weight of material may be tested in the form of a sphere or in the form of a very thin sheet of equal weight, yet the two experiments would present a very differing amount of surface in proportion to weight. The other test shown in loss of grams per square inch of surface is better, but in my judgment, it does not present a picture that can be visualized in terms of performance. This in my opinion can best be presented in terms of pentration per inch per year. That gives us a figure which conveys a definite impression as to what may be expected of material in service, for example, in one of these reports losses in grams per square inch vary between "no loss" and up to 0.0217 grams per square inch and within that range are the products of several mills. Now just how bad is 0.0217 grams per square inch, which by the way was the result of eleven cooks of 198 hours duration? Can any of you visualize how much that means in terms of penetration per year in a containing vessel, such as a digester made of such material? This figures out 0.007 inch penetration per year, not a very great amount. Furthermore, there is some indication that the result of attack is not quite uniform as it tends to decrease after an initial loss has taken place. This is not at all an unusual condition, for in some cases an initial loss may be followed by no loss at all for an indefinite period. In other cases, loss may not be directly proportional to time.

In the case of the other report where losses were given in percentage of total weight, I made a calculation on one of the samples which lost 0.011 per cent after ten cooks and that figures out to 0.01 inch penetration per year, slightly higher than the other report, but not a very great rate of corrosion; but I am not advised as to the temperatures, pressures or concentrations used in these respective experiments. It would appear, therefore, that an expectancy of not to exceed 0.01 inch penetration per year is quite reasonable with several commercial types of corrosion resistant steels now available. In confirmation of what I have stated about the resistance of the high chromium alloys or the chrome-nickel alloys containing a relatively small proportion of nickel, I have data in regard to a test in pure sulphur dioxide saturated with moisture based on samples of ferrous and non-ferrous alloys, for a period of thirty days, at a temperature of 160 to 180 deg. F. and at a pressure from 50 to 60 pounds per square inch. This test includes upward of 50 products, ferrous and non-ferrous, and dealing with the pure sulphur dioxide and it was again shown that the high chromium alloys of 24 to 27 per cent chromium and chromium-nickel steel (nickel 18.5, Chromium 9 per cent) gave very excellent performances; in fact, the metal remained perfectly bright at the end of thirty days and in exactly the condition in which it entered the test. This of course, refers to machined and polished samples which would be expected to behave very slightly better than the somewhat roughened surfaces of pickled bars.

Selection of Materials

Since there are two distinct types of alloys which may be expected to give entirely satisfactory results in the sulphite process, on what should we base a choice between the two materials? In general, experience has shown that the high chromium irons should be fabricated by riveting, while the chromium-nickel steel should be fabricated by welding. While either grade may be either welded or riveted, yet the former presents difficulties in welding due to tendency to brittleness. This tendency is lacking in the chromium-nickel steel, because the weld has no tendency to air harden and to become brittle. Either of the two steels could answer the requirements, but the chromium-nickel type is somewhat stronger and very much tougher as regards impact resistance and would probably permit of the use of lighter sections in construction than could be utilized if chrome-iron were used. Both steels have been put into tube form and both steels have been used in valves. The latter, however, produces better castings, particularly in high silicon modification, as represented by the composition of 18.5 per cent nickel, 9 per cent chromium and 2.5 percent silicon.

In my talks with paper manufacturers, I receive the impression that repairs and renewals are very heavy items in the paper industry and if your industry is anything like the steel business, it is not the mere cost of replacements and renewals, but the loss of production, which hurts. He have recently been asked to give assistance to an industry in which failures and loss of production are figured in terms of dollars per minute and where a shutdown for renewals is a matter of from one to two weeks time. It would seem that practical and laboratory tests have gone far enough to warrant the construction of a complete sulphite digester unit of corrosion resistant steels. If the digester tank were made of present outside dimensions there would be a gain of 25 to 30 per cent capacity, because it would not have to be lined. If made of the present inside dimensions there would be a very great saving in the total weight of the unit, in the foundations and in labor and materials for lining. Of course the plate material itself would be considerably more expensive than the ordinary steel plate but it can well be made of about one-half the thickness. In this connection, it may be mentioned that there are now several responsible and experienced engineering firms who are competent in fabricating and erecting problems in connection with the use of all types of corrosion resistant steels.

Turning now from sulphite conditions to another branch of industry in which alkalies and alkaline sulphides are used, we would like to present some data in regard to possible uses of corrosion resistant materials for various alkalies, salts and miscellaneous chemicals.

Effect of Alkalies

Before considering the action of black liquor upon the metal, we might first refer to the action of plain sodium hydrate or caustic soda. Very severe tests of this material have been made, consisting of starting with a 15 per cent solution, which was boiled down to a concentration which would solidify on cooling. Two hours boiling in 15 per cent solution produced an almost inappreciable loss. When the boiling was continued down to a scum no loss was found with Rezistals No. 2, No. 4, or No. 7, but an 18 per cent chromium steel showed a loss of 1.28 mgms. per square inch. Through the courtesy of Dr. Henry L. Joachim, chairman of your Corrosion and Waste Committees, we were provided with a quantity of black liquor from two different sources—one from Wisconsin and one from Louisiana. This material, I understand, is of somewhat variable composition and in addition to the water

content, contains from 9 to 10 per cent organic matter, and from 7 to 8 per cent of inorganic matter. The latter consists of approximately 64 per cent sodium carbonate, 10 per cent caustic soda, a small amount of sodium sulphide and chloride and upwards of 20 per cent sulphate and sulphite. There is usually present an appreciable amount of sodium silicate. The organic substances contained are not so easily identified. In general, they include acetone, sulphur compounds, resin oils, lignin and other compounds.

In the table below we give the results of boiling tests made with each of the two samples of black liquor, received from two different sources. The results, in general, are quite satisfactory for the wide range of materials tested. None of the materials were stained or discolored during the treatment. The eight hour tests referred to, mean an additional four hours on the same samples originally used, i.e., the second test was cumulative. Almost without exception, it appears that all the loss took place during the first boiling. It will be noted that two kinds of samples were used in the test. Those described as discs were samples cut from bars and ground to a very smooth finish. The samples indicated as sheet samples were hot rolled pickled sheets without any polishing and in general the surface they present is relatively quite rough in comparison with the disc samples. These losses are so extremely small that they are almost within the range of experimental error. Assuming that the corrosion is continuous and at a uniform rate, the maximum loss shown in any case is only 1/6 of a mgm. per day per square centimeter and this figures out to a little over 2/1000 of an inch penetration for a year.

So far as this test, therefore, is concerned any of the steels will appear entirely satisfactory in their resistance to black liquor and in the three of them there was no loss whatever from the action of either sample. If such results were confirmed by somewhat more prolonged tests, under actual working conditions, then the choice of materials which might be used would be entirely an economic question in which first cost and cost and convenience of fabrication would have to be considered.

CORROSION TEST WITH BLACK LIQUOR

Steel	Condition	Sample W		Sample L.	
		4 hrs.	8 hrs.	4 hrs.	8 hrs.
Stainless No. 12	Disc	.04	.04	0	0
Stainless No. 18	Disc	0	0	.041	.041
Stainless No. 18	Sheet	.018	.018	.018	.018
Rezistal No. 2600	Disc	0	0	0	0
Rezistal No. 2	Disc	0	0	0	0
Rezistal No. 4	Sheet	.041	.041	0.14	.027
Rezistal No. 4	Sheet	0	0	0	.024
Rezistal No. 7	Disc	0	0	0	0

Loss is expressed in mgms./cm.²

In conclusion, it would seem as though the corrosion resistant alloy steels now available, offer very great possibilities for use in the paper industry, with a view to cutting down maintenance and repair charges and for assuring continuous operation. In many branches of manufacture, their use provides a real step forward in conservation. The public does not yet realize the possibilities of conservation through the use of such materials. Researches of the past ten years or more have yielded the necessary products, but their introduction has been extremely slow. The alloy steels are relatively expensive but some day the public will realize that first cost is unimportant, if only parts which do not rust or wear can be had. The economic value of certain of these alloys is no longer in doubt, but habits of a lifetime are not easily changed. To replace in the public mind the basic assumption that "steels rust" with another formula—"some steels do not rust"—is no small undertaking.

Analysis of Hypochlorite Bleaching Materials

By W. L. Savell[1]

General

A good standard bleaching powder should contain at the time of shipment not less than 35 per cent of available chlorine. Due to the nature of the compound, it deteriorates rather rapidly with age and the consequent loss of active chlorine is increased at higher temperatures.

This tendency to lose active chlorine makes the analysis of the bleaching powder even more important than the regular testing of hypochlorite solutions made up regularly from chlorine and milk of lime. Inasmuch as the resulting solutions are identical however, the same procedure is applicable in the analysis of the solutions from either source. The only distinctive differences in the handling of the two materials are in the sampling and the preparation of solutions.

Bleaching Powder

Sampling

Samples should be taken from at least one out of every five drums in each shipment. A hole is made in the center of the drum sufficiently large to admit a 1½ inch tubular sampler. This sampler should be filled three times, inserting it in three different directions, namely, the first toward the top of the drum, the second horizontally and the third toward the bottom. The combined samples will be relatively representative of the contents of the drum. The drawn sample should be coned and quartered in the usual manner down to a size sufficient to fill an eight ounce bottle.

A suitable sampler may be constructed using 1 inch pipe with a smooth end, having no burr on the inside from pipe cutter.

Preparation of Solution

Weigh out 7.092 grams of the bleaching powder sample and transfer to a mortar. Moisten with water and grind thoroughly to eliminate all lumps. Continue mixing until sample becomes a uniform paste, then transfer the contents of the mortar to a one liter volumetric flask and make up with distilled water to the one liter mark. This solution should be well shaken to insure thorough mixing and should be again shaken just previous to taking out aliquot portions for analysis as described later.

Bleaching Liquid

In testing bleach liquor made up from chlorine and milk of lime, the preparation of solution is not necessary as described above but a portion is taken equivalent to approximately 2½ grams of available chlorine and diluted to a liter. For bleach liquors that run between 90 and 100 grams available chlorine per liter, a sample should be taken of the carefully mixed solution after thorough agitation using a 25 cc. pipette.

Standard Solutions

N/10 Sodium Arsenite ($NaAsO_2$)

Two methods are given for the determination of available chlorine; one is known as the Arsenite method and the other called the Bunsen method. The arsenite method calls for a N/10 solution of sodium arsenite prepared by dissolving 4.96 grams of pure, sublimed arsenious oxide (As_2O_3) in about 250 cc. of distilled water in which has been dissolved approximately 20 grams of sodium carbonate (Na_2CO_3). The solution should be agitated and warmed until the arsenic is entirely dissolved. It is then allowed to cool and is made up to one liter in a standardized volumetric flask at the temperature at which the flask has been calibrated. This solution is standardized against N/10 iodine, using the usual starch solution as indicator.

N/10 Sodium Thiosulphate ($Na_2S_2O_3$)

Dissolve 24.85 grams of sodium thiosulphate crystals

[1] Mathieson Alkali Works, Inc., New York, N. Y.

($Na_2S_2O_3.5H_2O$) in distilled water. This should be done in a one liter volumetric flask and a solution made up to the mark in the usual manner. This solution may be standardized against N/10 iodine or N/10 potassium bichromate, which has in turn, been standardized against a solution of the ferrous salt made from pure iron wire.

N/10 Iodine

Dissolve 25 grams of potassium iodide (KI) in 50 cc. of distilled water. To this solution add 12.7 grams of iodine. Agitate until thoroughly dissolved and make up to one liter in the usual manner. This solution should be kept in a cool, dark place in a dark colored bottle and should be restandardized at regular intervals against N/10 sodium thiosulphate.

Determination of Available Chlorine

Arsenite Method

Fifty cc. of the bleach sample solution prepared as above is run into a 400 cc. beaker. In taking this portion care should be exercised to make certain that the original solution is well agitated and thoroughly mixed previously. Run in an excess (50 cc.) of exactly N/10 sodium arsenite solution and titrate the excess with exactly N/10 iodine. Starch may be used as indicator. A direct measure of the percentage of available chlorine is indicated by the actual volume in cubic centimeters of the sodium arsenite solution consumed by the sample. This is determined by subtracting the cubic centimeters of iodine used from the number of cubic centimeters (50) of the arsenite solution originally run into the sample.

Bunsen Method

Pipette a 50 cc. aliquot into a 500 cc. Erlenmeyer flask. Add about 200 cc. H_2O and 2 grams of solid KI. Make acid with about 8 cc. of glacial acetic acid and titrate with N/10 $Na_2S_2O_3$ using starch as indicator.

Special Works Method

A special piece of equipment for quick determinations is available under the name of Mathieson Bleach Tester. This is a more or less automatic device in which the measurement of available chlorine is based on the evolution of oxygen and a measure of the pressure developed therefrom. This apparatus is suitable only for approximate determinations and should be checked regularly against standard volumetric analysis. Equipment may be purchased from Eimer & Amend, 203 Third avenue, New York.

The apparatus is contained in a special case and has some advantages where portability is desired. The determination is based on the following reaction:

$$Ca(OCl)_2 + H_2O = CaCl_2 + H_2O + O_2$$

This particular method has the advantage of being rapid and relatively accurate but as mentioned above, should only be considered as a works control determination and not as an accurate analysis.

Determination of Chlorates

A 50 cc. aliquot of the original solution is pipetted into the titrating jar of about 1500 cc. capacity. Add 20 cc. of 10 per cent KBr. The absorption apparatus is then attached and the absorption tube is about ¾ filled with a 5 per cent solution of KI. Add 100 cc. concentrated HCl to the sample through the thistle tube, shake and let stand for 5 minutes. Dilute the sample with water added through the thistle tube, allowing the escaping gases to pass through the KI solution, in the absorbing tube When the volume of the solution has become about 1200 cc. the KI solution in the absorption tube is blown over in the jar, allowing the escaping gases to pass through the thistle tube which is partly filled with 5 per cent KI solution. The absorption tube is washed with two successive portions of water, each of which is also blown over into the titrating jar as before. Allow the KI solution in the thistle tube to drain into the titrating jar. The whole is then well shaken to dissolve any Br_2 or I_2 in the air above the solution, after which the absorption apparatus is removed and the sample titrated with N/10 $Na_2S_2O_3$. This titration is a measure of the sum of the chlorate chlorine and available chlorine present.

$$\text{Grams } ClO_3\text{-}Cl/L = (\text{cc. } Na_2S_2O_3 \text{ in chlorate titration}) - (\text{cc. } Na_2S_2O_3 \text{ in av. Cl titration}) \times N \times .03546 \times 800$$

$$\text{Grams } Ca(ClO_3)_2/L = \text{grams } ClO_3\text{-}Cl/L \times .48644$$

Determination of Calcium Carbonate

Transfer a 50 cc. aliquot of the original solution to a 250 cc. Erlenmeyer flask and neutralize the available chlorine with an approximately 2 N solution of arsenite. Add a few glass beads and proceed as in the "Determination of $CaCO_3$ in the Analysis of Lime and Limestone." Do not add granular Al as the H_2 evolved forms AsH_3 which interferes with the determination.

Before the gas is absorbed in 25 per cent NaOH it is passed into an explosion pipette containing Hg with a shallow layer of concentrated brine solution containing KI. One passage of the gas over this solution should be enough to absorb any chlorine present not destroyed by the arsenite. The concentrated brine prevents the absorption of CO_2 which would take place if water were used.

A blank analysis must be run on the 2 N arsenite and subtracted from the result obtained.

$$\text{Grams } CaCO_3/L = (\text{grams } CO_2 \text{ present} - \text{grams } CO_2 \text{ in blank}) \times \frac{100}{44} \times 800$$

Determination of Total Alkali as Ca $(OH)_2$

To a 50 cc. aliquot of the original solution in a 400 cc. beaker, add about 150 cc. H_2O and 2 grams of *solid* KI. Run in exactly 20 cc. N/2 HCl and titrate the liberated I_2 with N/10 $Na_2S_2O_3$. Add 15 drops of sodium alizarin sulphonate and titrate to a buff colored end point with N/2 NaOH. The next drop will give a decided pink color.

$$\text{Grams } CaO/L \text{ total alkali} = (\text{cc. HCl} \times N) - (\text{cc. } Na_2S_2O_3 \times N) + (\text{cc. NaOH} \times N) \times .02804 \times 800$$

Shipping Paper Machine to Russia

[FROM OUR REGULAR CORRESPONDENT]

Watertown, N. Y., May 21, 1929.—Approximately sixty freight cars will be required in shipping the 234-inch news print paper machine being manufactured by the Bagley & Sewall Company for the Volga River Paper Mills at Bealakhma, Russia. It was also stated that the last parts for the machine must leave this city, by August 1. Only a few days ago nine freight cars were used in carrying parts of the machine to New York for shipment on a steamer going to Leningrad. From Leningrad the equipment must be carried inland in a southeasterly direction about 650 miles. As soon as the first parts arrive at their destination assembling operations will be started under direction of an expert crew from the plant in this city. One of the chief engineers of the company, Richard Gray, will leave this city about June 1 for Russia to superintend the placement of the big machine in the Volga mills. Several expert assemblers will accompany him but these men will be recruited from other parts of the country. It will take several months to erect the machine. Total shipping weight of the machine from this city will be about 1,600 tons. Shipments of parts will be made frequently and practically every freight steamer leaving for Leningrad for several weeks will carry parts. The big mills in Russia have heretofore used German machines.

Sitka Pulp Mill Arranges for Power

[FROM OUR REGULAR CORRESPONDENT]

Portland, Ore., May 18, 1929.—C. McC. Johnson has signed a five-year contract with the Mountain States Power Company for the furnishing of a maximum of 2,500 horsepower to the Sitka Spruce Pulp and Paper Mill and the sawmill to be operated in connection with this mill at Empire.

Correction

The article by M. W. Bray, entitled Chemistry of the Alkaline Pulp Process published in the Section of the Technical Association of the December 6th issue of the Paper Trade Journal contained several typographical errors. This article will appear corrected in Technical Association Paper which will be issued this month.

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Economic Changes Revealed Through Unemployment Conference

Section 1

Characteristics of the Years 1922-1929

Acceleration rather than structural change is the key to an understanding of our recent economic developments. Gradually the fact emerged during the course of this survey that the distinctive character of the years from 1922 to 1929 owes less to fundamental change than to intensified activity.

Forty years ago David A. Wells wrote his "Recent Economic Changes," showing that the quarter century which ended in 1889 was a period of "profound economic changes," which he described as "unquestionably more important and varied than during any former corresponding period of the world's history."

Each generation believes itself to be on the verge of a new economic era, an era of fundamental change, but the longer the committee deliberated, the more evident it became that the novelty of the period covered by the present survey rested chiefly in the fact that developments such as formerly affected our old industries have been recurring in our new industries. The changes have not been in structure but in speed and spread.

Invention is not a new art. Transportation and communication are not new services. The facilitating function of finance is older than coined currency. Agriculture is as ancient as history. Competition is not a new phenomenon. None of the changes in distribution on which emphasis has been laid in the last few years is basically new. Hand-to-mouth buying is old; sudden changes in style and demand are familiar; there is no new principle in instalment selling; co-operative marketing is no modern discovery; the chain-store movement dates back at least twenty-five years. But the breadth and scale and "tempo" of recent developments give them new importance.

The increased supply of power and its wider uses; the multiplication by man of his strength and skill through machinery, the expert division and arrangement of work in mines and factories, on the farms and in the trades, so that production per man-hour of effort has risen to new heights; the quickening of these instrumentalities through capital provided from the surplus incomes of a constantly widening proportion of our people—all these represent an accumulation of forces which have long been at work.

Extent of Economic Activity

The committee, like other observers, was early impressed by the degree of economic activity in these seven years. It was struck by the outpouring of energy which piled up skyscrapers in scores of cities; knit the forty-eight States together with 20,000 miles of airways; moved each year over railways and waterways more than a billion and a half tons of freight; thronged the highways with 25,000,000 motor cars; carried electricity to 17,000,000 homes; sent each year 3,750,000 children to high school and more than 1,000,000 young men and women to college; and fed, clothed and amused the 120,000,000 persons who occupy one-twentieth of the habitable area of the earth.

But while the period from 1922 to 1929 has been one of intense activity, the committee noted that this activity has been "spotty." Certain groups have been more active than other groups; certain industries busier than their neighbor industries, and certain geographical areas more prosperous than other areas.

While rayon manufacturers have worked at top speed, cotton mills have been on part time; while the silk hosiery industry, the women's shoe trade and the fur business have been active, there has been depression in the woolen and worsted industry; while dairying has been prosperous, grain growers have been depressed. Coal mining has been in difficulties, and classes of wholesalers and retailers have been under grave economic pressure. Progress has been made toward more stable employment in seasonal industries, yet "technological" unemployment, resulting from the displacement of workers by improved machinery and methods, has attracted attention.

Geographical differences also were noted. The Pacific States have made an extraordinary advance; the South has rapidly developed as a manufacturing area; the East North-Central Division has grown; while the New England States, and to some extent the Middle Atlantic section, have developed less rapidly and have experienced some difficulties in adapting their older industries to new conditions.

However, in spite of this variability this difference in activity as between groups and areas and industries, the rising standard of living characteristic of this period, was widespread and has reached the highest level in our national history.

Participation by the people as a whole in many of the benefits of increased productivity, which of itself varied as between different groups and geographical areas, has been one of the marked characteristics of the period. While industrial, agricultural and commercial activity has been "spotty," the broad social advantages of our accelerated activity flowed out over the land.

For example, the highway-building programs throughout the nation were not limited to the intensely active areas; good roads were extended in all directions, serving the whole population. The same might be said for educational advantages, radio entertainment, personal mobility made possible by low-priced motor cars,

swift and dependable transportation and communication and numerous other facilities and services making for comfort and well-being, beyond the elemental requirements of food, clothing and shelter.

This spread of higher living standards has been characteristic of our national life practically throughout our history. As a phenomenon it is not new, but in its degree and scope it has taken on a new importance.

Characteristic also has been the rise in the use of power—three and three-quarters times faster than the growth in population—and the extent to which power has been made readily available not alone for driving tools of increasing size and capacity but for a convenient diversity of purposes in the smallest business enterprise and on the farm and in the home.

Factories no longer need cluster about the sources of power. Wide-spread inter-connection between power plants, arising out of an increasing appreciation of the value of flexibility in power, and made possible by technical advances during recent years, has created huge reservoirs of power, so that abnormal conditions in one locality need not stop the wheels of industry.

The increasing flexibility with which electricity can be delivered for power has enabled manufacturers and farmers to meet high labor costs by the application of power-driven specialized machines; and power in the flexible form has penetrated into every section of the United States, including many rural areas. The survey shows that as a nation we now use as much electrical energy as all the rest of the world combined.

Through the sub-division of power the unskilled worker has become a skilled operator, multiplying his effectiveness with specialized automatic machinery and processes. Thus the unit cost of production has been reduced, the drudgery eliminated from much unskilled work and wages maintained or actually increased.

Spread in the Source and Use of Credit

This acceleration of forces and its resultant rising standard of living have been facilitated by a continuing supply of funds.

In the breadth of the sources from which capital and credit have been available and in the quickening method of their use may be observed again the changes in speed and spread of our recent economic activity.

In former periods the savings funds of the American people were not alone adequate for our capital requirements. In periods of business expansion the demand for funds pressed heavily upon the supply.

The reverse has been found to be true in the period under review. For the larger part of this period not only the earnings and savings of the people supplied the additional capital for financing the rapid development of industry, but in addition they furnished several billions of dollars for loans to foreign countries.

Stimulated by the urge for funds to finance the vast production program of the United States during the World War, the number of shareholders in the country's business enterprises has, it is estimated, grown from about 2,000,000 to about 17,000,000; and out of increasing incomes these investors have continued to pour their savings into the stream of credit.

During the later months of the period covered by the survey a new tendency has been observed. Investors, as well as a large body of speculators, have invested through the stock exchanges not only their savings but the proceeds of loans secured through banks and brokers, until the credit structure of the country has been sufficiently weighted to indicate a credit stringency, resulting in an abnormally high rate for call money and an appreciable increase in the rate of interest for business purposes. The consequences of this process cannot be measured at this time, but they are factors in the problem of maintaining economic balance which will be touched on later in this report.

Meanwhile industry has been able to reduce its requirements for short-term credits from the banks through issuance of securities. The preference for permanent methods of financing business is reflected in the relatively small increase in commercial loans of banks in recent years, as contrasted with the increase in security holdings and collateral loans.

Imports of gold early in the period covered by the survey which tended to make credit easier; the growth of savings in spite of increased spending; the popular confidence in the financial structure, especially in the Federal Reserve System, and the power of the System to move available credit to the places where it is needed, mark a great advance during these seven years.

There has also been an increase in the velocity of the turnover of credit, due to improved transportation and communication, scientific control of inventories, the continuation of the simplification movement and our accelerated turnover of commodities. Business has thus developed a new degree of economy in the use of credit, which may be set down as another characteristic of the period.

Section 2

Price Relationships, Wages and Cost of Living

The period under review is perhaps too brief for a definite judgment, and we are as yet too close in point of time to get an accurate perspective, but the committee feels that in the field of price relationships, wages and the cost of living is to be found one of the striking and significant developments revealed by the survey, and one which more than any other gives these years their distinctive character.

Contrasting two periods of our comparatively recent economic history will perhaps serve to make clear the significance of these factors.

According to the best available statistics, in the period between 1896 and 1913 the wholesale price level rose on the average 2.3 per cent a year, but wages rose only a little more, so that their purchasing power advanced only 0.5 per cent a year. In the period from 1922 to 1927 prices declined on the average 0.1 per cent per year, while the purchasing power of wages rose 2.1 per cent a year.

In this latter period the fortunate synchronizing of a high wage level and a stationary cost of living created a phenomenon, new in degree, which had widespread influence on the economic situation, and which will bear close study in its details.

The increasing tendency toward price stability, both as between classes of commodities and in the price experience of individual commodities was a characteristic of the period under review, tending toward a more equitable basis of exchange of products among the various groups.

Price fluctuations seem to have been held within narrow limits during this period by a combination of factors: A more complete background of statistical information making possible better judgment regarding supply and demand on the part both of producers and consumers, prudence on the part of management, cost reductions by technicians, skill on the part of bankers, an enlightened attitude on the part of labor and the expansion of foreign markets.

Relative price stability has involved a change in the direction in which business men look for profits. Profits made from the fluctuations of individual commodity prices and from changes in the relation among prices have tended to diminish.

Whether the price relationships of recent years prove to be transitory or permanent, they represent today a huge gain which is reflected in all parts of the economic organism. It is a development too new to permit of dogmatic interpretation, but the committee believes that this decreasing variability in prices at a time when the productivity per hour of labor has been greatly increased and the demand for goods has been greatly stimulated, is one of the most significant factors disclosed by the survey.

The widening gap between wages and the cost of living—wages increasing while the cost of living was stationary—may be assumed to have contributed definitely to the degree of prosperity which has characterized the period as a whole. With rising wages and relatively stable prices we have become consumers of what we produce to an extent never before realized.

The factors in this situation appear in part to be accidental and in part the consequences of an advanced economic point of view.

In the early post-war period much of the press and many em-

ployers demanded a "liquidation" of labor. It was freely declared that business could not settle down until wages were brought back to pre-war levels. Labor had enjoyed a higher standard of living and naturally opposed wage cuts.

This might have precipitated a period of serious strife had it not been that leaders of industrial thought, watching the trend of affairs, noted that the result of the continuance of high wages was that the dammed up purchasing desires which had been held back during the war on account of the national economic program burst forth and not only the high wages which were being currently earned but accumulated savings as well were poured into the channels of commerce.

They were quick to grasp the significance of the power of the consumer with money to spend to create an accelerated cycle of productivity.

They began consciously to propound the principle of high wages and low costs as a policy of enlightened industrial practice. This principle has since attracted the attention of economists all over the world, and while it is in no sense new its application on a broad scale is so novel as to impress the committee as being a fundamental development.

Production Increase and Expansion of Human Wants

Partly as a result of this newly sensed principle of an accelerated cycle of production-consumption, and partly by reason of the development of a stream of credit and an abundance of flexible power made broadly available, the years 1922 to 1929 witnessed a marked increase in the physical volume of production. Some years stand out more conspicuously than others; two, 1924 and 1927, show minor recessions; but the period as a whole has been notably consistent.

Since 1922 primary production has been increasing 2.5 per cent a year; manufacturing, 4 per cent a year; transportation, 4 per cent. Taking 1919, a year of fair harvests, as a base, crop production in 1922 was 102; in 1925, 104; in 1927, 106.

There have been prosperous periods in the past which may have surpassed these rates of increase, but none so far as the committee can learn which has shown such a striking increase in productivity per man-hour. Notwithstanding the reductions in hours of labor per capita productivity is nearly 60 per cent greater than it was toward the close of the nineteenth century; the increase in per capita productivity in manufacturing from 1922 to 1925 was 35 per cent; the productivity of farm workers has increased at a rate probably never before equaled.

And these increases in productivity have been joined to a corresponding increase in the consuming power of the American people. Here has been demonstrated on a grand scale the expansibility of human wants and desires.

Economists have long declared that consumption, the satisfaction of wants, would expand with little evidence of satiation, if we could so adjust our economic processes as to make dormant demands effective. Such an expansion has been going on since the beginning of the industrial revolution. It is not a phenomenon of the post-war period, except in degree. But it is this degree of economic activity, this almost insatiable appetite for goods and services, this abounding production of all things which almost any man can want, which is so striking a characteristic of the period covered by the survey.

Optional Consumption

The committee finds, from a study of the fact-finding survey on which this report is based, that as a people we have become steadily less concerned about the primary needs, food, clothing and shelter. We have long since lost all fear concerning our food supply, and so we no longer look on food as a luxury or as a primary source of pleasure. American food standards have risen, but we hear little of the "high cost of living," and the slogan of the "full dinner pail" is obsolete. We wear less clothing; more rayon and silks, less cotton and wool. Our wants have ranged more widely and we now demand a broad list of goods and service which come under the category of "optional purchases."

The rapidly increasing number of families in the United States having a considerable margin of earnings available for "optional consumption"—optional in the sense that this portion of the income may be saved or spent, and if spent the manner of its spending may be determined by the tastes of the consumer or the nature of the appeals made to him by the industries competing for his patronage—presents one of the marked characteristics of the recent economic situation. It is the personal or individual expression of the gap between rising wages and the relatively stable cost of living, referred to at the beginning of this section.

Closely related to the increased products is the consumption of leisure.

It was during the period covered by the survey that the conception of leisure as "consumable" began to be realized upon in business in a practical way and on a broad scale. It began to be recognized, not only that leisure is "consumable," but that people cannot "consume" leisure without consuming goods and services, and that leisure which results from an increasing man-hour productivity helps to create new needs and new and broader markets.

The increasing interest in the fine arts and in science; the increased sales of books and magazines; the increase in foreign travel; the growing interest and participation in sports of all kinds; the domestic pilgrimages of some 40,000,000 motor tourists who use more than 2,000 tourist camps; the greatly increased enrollment in our high schools and colleges; the motion-picture theaters and the radio—all these reflect the uses of increasing leisure.

During the period covered by the survey the trend toward increased leisure received a considerable impetus. The work week was shortened in the factory by better planning and modern machinery, and the workday was shortened in the home by the increased use of time and labor saving appliances and services.

Few of the current economic developments have made such widespread changes in our national life or promise so much for the future as the utilization of our increasing leisure.

The service functions are not new, but few of the developments revealed by the survey are of greater potential significance than the accelerated growth of our service industries, travel, entertainment, education, insurance, communication; the facilities of hotels, restaurants, delicatessen stores, steam laundries and public libraries, to mention but a few.

An evolution which has been going on for centuries has only recently been revealed as a mass movement. We now apply to many kinds of services the philosophy of large-scale production. We have integrated these services and organized them and we have developed the new philosophy to such a degree in recent years that we now have what might be termed "mass services." These have helped to create a new standard of comfortable living in the United States, and have afforded employment for millions of workers crowded out of agriculture and the extractive and fabricating industries.

It was, in fact, timely development and "mass services" which saved our country from a critical unemployment problem during recent years.

No serious cylical fluctuations have characterized the period under review, so that the unemployment due to the business cycle has not been marked; but it has become evident that unemployment can arise as a result of industrial efficiency as well as inefficiency. In the latter case we have seasonal or intermittent unemployment; in the former case what has come to be known as "technological" unemployment resulting from the introduction of new machinery and processes.

The survey seems to indicate that the time has come to devote continuing attention, not only to the problems of cyclical unemployment, but also to this newer problem of "technological" unemployment if we are to forestall hardship and uncertainty in the lives of the workers.

Where progress may be working an advantage to the people as a whole, it inevitably works temporary hardship upon certain

classes, those skilled workers in a trade, for example, whose work is taken over by machines. This is a serious aspect of the problem of unemployment. It involves, in many instances, learning new trades, and, in most instances, the loss of time in securing other jobs. Yet from a broad social point of view, while it works hardship on those workers displaced by the introduction of machinery or improved processes, the social gain is real and permanent.

Such economic transformations are not so much changes as readjustments, due to the progressive needs of modern society and to the necessity of taking advantage of the modern developments in science. They have risen in agriculture as well as manufacturing and transportation, and they have affected employers as well as employes. There is nothing new about these problems; the accelerated rate of readjustment is what has recently engaged the attention of wage earners and management.

As has already been intimated, the acceleration of technological shifts in production and consumption would have resulted in much more serious unemployment if workers had not been absorbed in the newly expanded service industries which both create and serve leisure.

Our Natural Advantages

It is obvious, of course, that the economic position of this nation is in no slight degree due to our possession of abundant raw materials and sources of power, to the fact that our domestic market is so large, and that there are no trade barriers between the States of our Union. We can exchange goods without stopping them for inspection or the payment of duties between States. We can effect their transfer without the barriers of differing languages or customs. Advertising is peculiarly effective because we have so great an area with a common language which enables us to talk to all the people and to develop national consumption habits, which in turn make possible large-scale production.

This fortuitous situation should be borne in mind as an important factor in both the speed and the spread which have characterized our recent economic development.

The balance which has been maintained between consumption and production is nowhere better shown than in the fact that wages have been rising, and that there has been no striking increase of unemployment in a period marked by the broadest technological advancement which we have yet known.

Perhaps the deepest economic significance of the new situation lies, not in the rapidity with which the service industries have grown and have become integrated, nor in the universality of their spread, but in the fact that the situation which they have created is reciprocal. Our increasing standard of living is not participated in only by those who produce our food, clothing and shelter, but has flowed back to those in the service industries. The population as a whole can enjoy the rising standard of living, the music which comes in over the radio, the press, the automobile and good roads, the schools, the colleges, parks, playgrounds and the myriad other facilities for comfortable existence and cultural development.

Our ancestors came to these shores with few tools and little organization to fight nature for a livelihood. Their descendants have developed a new and peculiarly American type of civilization in which services have come to rank with other forms of production as a major economic factor.

Remote Saturation Points

The survey has proved conclusively what has long been held theoretically to be true, that wants are almost insatiable; that one want satisfied makes way for another. The conclusion is that economically we have a boundless field before us; that there are new wants which will make way endlessly for newer wants, as fast as they are satisfied.

We have the power to produce and the capital to bring about exchange between the producing and consuming groups. We have communication to speed and spread the influence of ideas. We have swift and dependable transportation. We have an educational system which is steadily raising standards and improving tastes. We have the sciences and arts to help us. We have a great national opportunity.

Important as is the development of the economic side of our national life, through invention and discovery of new industries and new callings, an illustration of the potentialities of further lifting the national standard of living, without developing another invention or discovery and without creating a new want, can be drawn from a single industry—that of electrical appliances.

A home or farm wired for electricity is a different economic unit from one which is not wired. Each such home, whether in city or country, can take advantage of electricity for lighting, and on the farm an automatic water-supply system makes available water at convenient spots for domestic and farm uses.

A survey of city and village homes indicates the use of electricity for many additional applications of highly specialized devices. In 1928 apparently a large percentage of the homes wired for electricity had electric flatirons; less than one-third of them had washing machines; slightly over one-third of them had vacuum cleaners; less than 5 per cent had electrical refrigerators. We are far from the saturation point in connection with any of these devices.

To take one other example, there is, perhaps, no more dramatic illustration of a rising standard of living than the growth and development of radio in recent years. This newest application of electricity has found its way into millions of homes. On January 1, 1928, there were 7,500,000 sets in use. Yet about 70 per cent of American homes are still without the radio.

We seem only to have touched the fringe of our potentialities.

Section 3

Economic Balance

Many influences have been at work during the period covered by the survey welding the people of the United States into a new solidarity of thought and action. The telephone and telegraph, the automobile, the radio and the railroads form lines of communication which have brought together East and West, South and North.

Other and less tangible influences reaching further into the past, but accelerated and strengthened by the experiences of the World War, have also contributed to our solidarity. Economic reorganization; the cooperation of business leaders, economic experts and the government; the general spread of information; the growth of trade associations; the cooperation of labor to increase productivity; the restriction of immigration—all of these have grown in importance in peace after their stimulation of the war.

Making for solidarity has been popular education, which has increased amazingly. We are spending $2,500,000,000 each year on public and private education, an increase of 250 per cent in a decade. Expenditures for free college and university education have increased nearly 350 per cent in little more than ten years.

And there is another factor which has contributed to the welding process, and to the economic advancement of the nation: The broadening influence of America's creative minds, the minds of the leaders in government and in education, in research, in management and in labor, in the press and in the professions. To their influence we have come to look in large measure for the maintenance of our economic balance.

While ours has been a period of great economic activity and industrial productivity, and of a degree of economic stability which must be rated as high when we consider the readjustments in every department of economic life made necessary by the post-war crisis and by the transition from war economy to peace economy; and while America has a promising future, the outstanding fact which is illuminated by this survey is that we cannot maintain our economic advantage, or hope fully to realize on our economic future unless we consciously accept the principle of equilibrium and apply it skillfully in every economic relation.

The forces that bear upon our economic relationships have always been sensitive. All parts of our economic structure, from

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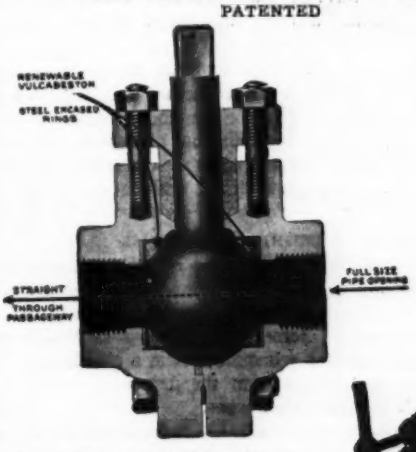

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the prime processes of making and of marketing to the facilitating functions of finance, are and have been interdependent and easily affected. And therein lies the danger: That through ignorance of economic principles, or through selfish greed, or inadequate leadership, the steady balance will be distributed to our economic detriment.

If natural resources, especially the land, are wastefully used; if money in quantity is taken out of production and employed for speculation; if any group develops a method of artificial price advancement which puts one commodity out of balance with other commodities; if either management or labor disregards the common interest—to this extent equilibrium will be destroyed, and destroyed for all.

Public Leadership Is Essential

To maintain the dynamic equilibrium of recent years is, indeed, a problem of leadership which more and more demands deliberate public attention and control. Research and study, the orderly classification of knowledge, joined to increasing skill well may make complete control of the economic system a possibility. The problems are many and difficult, but the degree of progress in recent years inspires us with high hopes.

In the marked balance of consumption and production, for example, the control of the economic organism is increasingly evident. With the development of a stream of credit to facilitate business operations, and with flexible power to energize industry and to increase the effectiveness of the workers, has come an increasing evenness in the flow of production once an intermittent starting and stopping of production—consumption was characteristic of the economic situation. It was jerky and unpredictable, and overproduction was followed by a pause for consumption to catch up. For the seven years under survey, a more marked balance of production-consumption is evident.

With greater knowledge of consuming habits, with more accurate records of the goods consumed, a sensitive contact has been established between the factors of production and consumption which formerly were so often out of balance.

Where pools of goods once were accumulated by the manufacturer, the wholesaler, the jobber and the retailer; where high inventories once meant distress, shutdowns, failures, and unemployment whenever the demand subsided, there is now a more even flow from producer to consumer.

Increasing skill and scientific data have made the anticipation of demand far more accurate, and by accurate anticipation the deliberate balance between production and consumption has in a measure been maintained. By advertising and other promotional devices, by scientific fact finding, by a carefully pre-developed consumption, a measurable pull on production has been created which releases capital otherwise tied up in immobile goods and furthers the organic balance of economic forces. In many cases the rate of production-consumption seems to be fairly well under control.

To maintain this balance and to extend it into fields which are not now in balance with the more prosperous elements of the nation, is clearly an important problem of leadership. With certain natural resources still wastefully exploited, with great industries such as agriculture and coal mining still below the general level of prosperity, with certain regions retarded, there remains much to do. To bring these more fully into the stream of successful economic forces is a problem.

Technique of Balance Called For

Our complex and intricate economic machine can produce, but to keep it producing continuously it must be maintained in balance. During the past few years equilibrium has been fairly well maintained. We have not wasted the hours of labor by strikes or lockouts. Until recently we have not diverted savings from productive business to speculation. There has been balance between the economic forces—not perfect balance, but a degree of balance which has enabled the intricate machine to produce and to serve our people.

As long as the appetite for goods and services is practically insatiable, as it appears to be, and as long as productivity can be consistently increased, it would seem that we can go on with increasing activity. But we can do this only if we develop a technique of balance.

Toward such a technique the committee believes the skillful work of the economists, engineers and statisticians who prepared the survey on which we have based the facts and interpretations expressed in this brief report, will contribute. Our effort has been to suggest a pattern by which their work may be appraised; to set up an orderly plan by which the facts may be articulated and against which later and better information may be more accurately judged. We recommend a study of the fact-finding survey as a whole to all who are faced with the problems of business administration and public leadership.

Informed leadership is vital to the maintenance of equilibrium. It depends upon a general knowledge of the relations of the parts each to the other. Through incessant observation and adjustment of our economy, we can learn to maintain the economic balance.

Underlying recent developments is an attitude of mind which seems to be characteristically American. Our nation is accustomed to rapid movement, to quick shifts in status; it is receptive to new ideas, ingenious in devices, adaptable. Our economy is in large measure the embodiment of those who have made it.

Our situation is fortunate, our momentum is remarkable. Yet the organic balance of our economic structure can be maintained only by hard, persistent, intelligent effort; by consideration and sympathy; by mutual confidence, and by a disposition in the several human parts to work in harmony together.

Herbert Hoover	Lewis E. Pierson
Walter F. Brown	John J. Raskob
Renick W. Dunlap	Arch W. Shaw
William Green	Louis J. Taber
Julius Klein	Daniel Willard
John S. Lawrence	Clarence M. Woodley
Max Mason	Owen D. Young
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New Deep Well Turbines

The American Well Works announces their new 6 inch and 8 inch deep well turbines. These turbines have been built in response to a demand for a turbine to fit smaller bored wells. The deep well turbine consists of the turbine head proper, which is the driving unit, the supporting pipe, which encloses the driving shaft, and the turbine itself, which consists of the number of stages necessary for the specific requirements.

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Engineering data and construction details of these turbines may be had from the engineering department of The American Well Works, Aurora, Ill.

Finnish News Print Output

Washington, D. C., May 22, 1929.—Of Finnish news print exports last year, amounting to 171,564 metric tons, 51,420 tons were to the United Kingdom, approximately 39,000 tons each to Russia and the United States, and 16,626 tons to South America, principally Argentina and Brazil. Exports to the Far East totaled only 4,584 tons of which China received 3,294 tons. The remainder went largely to European countries, the Levant and northern Africa.

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SUMMARY

Cigarette paper .....214 cs.
Wall paper .....35 bls., 11 cs.
Paper hangings .....39 bls., 6 cs.
Raw hanging stock .....191 rolls
News print .....1108 rolls
Printing paper .....244 cs.
Wrapping paper .....13 rolls, 90 cs.
Marble paper .....8 cs.
Colored paper .....62 cs.
Filter paper .....35 bls., 32 cs.
Drawing paper .....10 cs.
Writing paper .....3 cs.
Tissue paper .....50 cs.
Decalcomania paper .....42 cs.
Surface coated paper .....155 cs.
Metal paper .....12 cs.
Baryta coated paper .....84 cs.
Photo paper .....4 cs.
Basic paper .....25 cs.
Greaseproof paper .....55 cs.
Stencil paper and ink .....105 cs.
Tracing paper .....6 cs.
Miscellaneous paper .....121 rolls, 103 bls., 115 cs.

CIGARETTE PAPER

P. J. Schweitzer, Pr. Johnson, Marseilles, 81 cs.
F. C. Strype, Pr. Johnson, Genoa, 6 cs.
Standard Products Corp., Paris, Havre, 127 cs.

WALL PAPER

F. J. Emmerich, Adriatic, Liverpool, 1 cs., 8 bls.
A. C. Dodman, Jr., Inc., Pr. Roosevelt, Bremen, 1 bls.
F. A. Binder, Pr. Roosevelt, Bremen, 4 bls.
A. C. Dodman, Jr., Inc., Karlsruhe, Bremen, 3 bls.
S. Stern Stiner & Co., St. Louis, Hamburg, 1 bls.
J. E. Bernard & Co., St. Louis, Hamburg, 6 bls.
F. J. Emmerich, St. Louis, Hamburg, 5 bls.
G. J. Hunken, Columbus, Bremen, 5 cs.
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F. A. Binder, Columbus, Bremen, 1 cs., 7 bls.
A. C. Dodman, Jr., Inc., Mauretania, Southampton, 2 cs.

PAPER HANGINGS

A. C. Dodman, Jr., Inc., Adriatic, Liverpool, 1 bls.
A. C. Dodman, Jr., Inc., Scythia, Liverpool, 1 bls.
W. H. S. Lloyd & Co., American Trader, London, 34 bls.
F. J. Emmerich, Paris, Havre, 3 bls.
Whiting & Patterson Co., Inc., Mauretania, Southampton, 6 cs.

RAW HANGING STOCK

F. & R. Trading Corp., Pr. Roosevelt, Bremen, 191 rolls.

NEWS PRINT

Journal of Commerce, Regnhildsholm, Helsingfors, 52 rolls.
Parsons & Whittemore, Inc., Regnhildsholm, Helsingfors, 926 rolls.
F. Henjes, Jr., St. Louis, Hamburg, 70 rolls.
Parsons & Whittemore, Inc., Argosy, Hango, 60 rolls.

PRINTING PAPER

P. C. Zuhlke, Lapland, Antwerp, 52 cs.
Gallagher & Ascher, Pr. Roosevelt, Bremen, 28 cs.
Globe Shipping Co., Pr. Roosevelt, Bremen, 1 cs.
Gallagher & Ascher, Karlsruhe, Bremen, 25 cs.
International F'd'g Co., Tomalva, Antwerp, 24 cs.
Walker Goulard Plehn Co., Ragnhildsholm, Helsingfors, 40 cs.
——, Ragnhildsholm, Helsingfors, 27 cs.
E. Dietzgen & Co., St. Louis, Hamburg, 15 cs.
Dinglestedt & Co., Columbus, Bremen, 22 cs.
J. J. Shore & Co., Columbus, Bremen, 10 cs.

WRAPPING PAPER

Birn & Wachenheim, Lapland, Antwerp, 58 cs.
Standard Products Corp., Lapland, Antwerp, 3 cs., 13 rolls.
C. Steiner, St. Louis, Hamburg, 24 cs.
Phoenix Shipping Co., St. Louis, Hamburg, 5 cs.

MARBLE PAPER

E. Daiber, Lapland, Antwerp, 8 cs.

COLORED PAPER

Borden Riley Paper Co., Lapland, Antwerp, 2 cs.
J. Wannamaker, Karlsruhe, Bremen, 3 cs.
S. Gilbert, Columbus, Bremen, 30 cs.
Kupfer Bros., Columbus, Bremen, 17 cs.
Judson Freight F'd'g Co., Columbus, Bremen, 10 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Tuscania, London, 17 cs.
H. Reeve Angel & Co., Inc., Olympic, Southampton, 35 bls.
C. Schleicher Schull Co., St. Louis, Hamburg, 15 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Tuscania, London, 10 cs.

WRITING PAPER

Globe Shipping Co., Paris, Havre, 1 cs.
B. Altman & Co., Mauretania, Southampton, 2 cs.

TISSUE PAPER

H. Schutte Co., Roma, Genoa, 18 cs.
P. J. Schweitzer, Pr. Johnson, Marseilles, 13 cs.
F. C. Strype, Pr. Johnson, Genoa, 3 cs.
F. C. Strype, Scythia, Liverpool, 2 cs.
F. B. Vandegrift & Co., Scythia, Liverpool, 23 cs.
G. W. Sheldon & Co., American Trader, London, 3 cs.

DECALCOMANIA PAPER

G. W. Sellers, Pr. Roosevelt, Bremen, 6 cs.
G. W. Sellers, Columbus, Bremen, 5 cs.
B. F. Drakenfeld & Co., Adriatic, Liverpool, 31 cs. (duplex).

SURFACE COATED PAPER

Gevaert Co. of America, Lapland, Antwerp, 108 cs.
P. C. Zuhlke, Lapland, Antwerp, 39 cs.
Globe Shipping Co., St. Louis, Hamburg, 4 cs.
Phoenix Shipping Co., St. Louis, Hamburg, 4 cs.

METAL PAPER

Hensel Bruckman & Lolbacher, Karlsruhe, Bremen, 12 cs.

BARYTA COATED PAPER

Globe Shipping Co., Columbus, Bremen, 84 cs.

PHOTO PAPER

Guaranty Trust Co., St. Louis, Hamburg, 4 cs.

BASIC PAPER

American Express Co., Lapland, Antwerp, 25 cs.

GREASEPROOF PAPER

Central Union Trust Co., St. Louis, Hamburg, 45 cs.
American Express Co., St. Louis, Hamburg, 10 cs.

STENCIL PAPER AND INK

Arlac Dry Stencil Co., St. Louis, Hamburg, 105 cs.

TRACING PAPER

Keuffel & Esser Co., St. Louis, Hamburg, 6 cs.

MISCELLANEOUS PAPER

Arkell Safety Bag Co., Sulanierco, Gothenburg, 103 rolls.
Union Paper & Twine Co., Sulanierco, Gothenburg, 63 bls., 18 rolls.
T. Barrett & Son, Sulanierco, Gothenburg, 23 bls.
Wilkinson Bros. & Co., Inc., Sulanierco, Gothenburg, 13 bls.
F. C. Strype, Lapland, Antwerp, 1 cs.
E. H. Sargent Co., Gripsholm, Gothenburg, 10 cs.
P. J. Schweitzer, Paris, Havre, 18 cs.
A. C. Dodman, Jr., Inc., Paris, Havre, 3 cs.
Standard Products Corp., Paris, Havre, 79 cs.
Houbigant, Inc., Paris, Havre, 3 cs.
Happel & McAvoy, Olympic, Southampton, 1 cs., 4 bls.

RAGS, BAGGINGS, ETC.

National City Bank, Adriatic, Liverpool, 48 bls. bagging.
B. Leibowitz, Adriatic, Liverpool, 9 bls. rags.
Mutnick Bros. & Co., Adriatic, Liverpool, 11 bls. rags.
Furniss Withy & Co., London Exchange, London, 115 bls. rags.
J. B. Moors & Co., London Exchange, London, 137 bls. rags.
Gallagher & Ascher, London Exchange, London, 63 bls. rags.
Philadelphia National Bank, West Nonska, Dublin, 87 bls. rags.
Van Oppen & Co., Pr. Roosevelt, Bremen, 49 bls. linen waste.
Merchants National Bank, Pr. Roosevelt, Bremen, 5 bls. rags.
Ralli Bros., Pr. Roosevelt, Bremen, 18 bls. jute card waste.
E. Butterworth & Co., Inc., Pr. Roosevelt, Bremen, 17 bls. rags.
Manufacturers Trust Co., Gallier, Antwerp, 17 bls. rags.
W. Schall & Co., Gallier, Antwerp, 130 bls. bagging.
Castle & Overton, Inc., Tuscania, London, 67 bls. rags.
National City Bank, Tuscania, London, 23 bls. rags.
Gallagher & Ascher, Tuscania, London, 39 bls. rags.
D. I. Murphy, Exchester, Lechorn, 109 bls. rags.
E. J. Keller Co., Inc., Exchester, ——, 86 bls. rags.
E. A. Stone Co., Inc., Hatteras, Manchester, 12 bls. rags.
Public National Bank, Hatteras, Manchester, 22 bls. rags.
Myers Lipman Woolstock Co., Hatteras, Manchester, 12 bls. rags.
J. Cohen Sons, Inc., Hatteras, Manchester, 11 bls. rags.
Leigh Textile Co., Hatteras, Manchester, 19 bls. cotton waste.
Hill & Cutler Co., Hatteras, Manchester, 50 bls. cotton waste.
R. M. Gray, Inc., Hatteras, Manchester, 54 bls. paper stock.
E. J. Keller Co., Inc., Hatteras, ——, 86 bls. bagging.
Brown Bros. & Co., Minnesota, London, 63 bls. rags.
Brown Bros. & Co., Tomalva, Antwerp, 66 bls. rags.
The Barrett Co., Tomalva, Antwerp, 135 bls. bagging.
Whaling Waste Products Co., Tomalva, Antwerp, 610 bls. rags.
Amsinck Sonne & Co., Inc., Tomalva, Antwerp, 108 bls. flax waste.
W. Schall & Co., St. Louis, Hamburg, 117 bls. cotton waste.
A. W. Fenton, Inc., St. Louis, Hamburg, 126 bls. rags.
Manufacturers Trust Co., St. Louis, Hamburg, 29 bls. rags.
Castle & Overton, Inc., St. Louis, Hamburg, 11 bls. rags.
A. Schwarz, St. Louis, Hamburg, 39 bls. rags.
J. Cohen Sons, Inc., Scythia, Liverpool, 18 bls. rags.
M. Snedeker Corp., Scythia, Liverpool, 118 bls. paper stock.
Castle & Overton, Inc., Coahoma County, Rotterdam, 51 bls. bagging.
E. J. Keller Co., Inc., City of Kobe, ——, 150 bls. rags.
E. J. Keller Co., Inc., Marengo, ——, 125 bls. rags; 57 bls. bagging; 139 bls. threads; 527 bls. flax waste.

OLD ROPE

Castle & Overton, Inc., London Exchange, London, 100 coils.
Brown Bros. & Co., Lapland, Antwerp, 50 bls.
Brown Bros. & Co., Gallier, Antwerp, 49 bls.
International Purchasing Co., Siboney, Havana, 23 bls., 19 coils.
Brown Bros. & Co., St. Louis, Hamburg, 29 coils.

CASEIN

D. C. Andrews & Co., St. Louis, Hamburg, 155 bags.
National City Bank, Biela, B. Ayres, 1,888 bags.

WOOD PULP

Atterbury Bros., Inc., Hellig Olav, Oslo, 250 bls. wood pulp, 50 tons.
——, Karlsruhe, Bremen, 155 bls. wood pulp.
Parsons & Whittemore, Inc., Gripsholm, Gothenburg, 475 bls. sulphite.
Price & Pierce, Ltd., Gripsholm, Gothenburg, 1,000 bls. wood pulp.
Irving Trust Co., Ragnhildsholm, Helsingfors, 150 bls. wood pulp.
——, Ragnhildsholm, Helsingfors, 1,618 bls. sulphate.
——, Ragnhildsholm, Helsingfors, 978 bls. sulphite.
Castle & Overton, Inc., St. Louis, Hamburg, 1,187 bls. wood pulp, 178 tons.
Castle & Overton, Inc., Coahoma County, Rotterdam, 200 bls. wood pulp.
Pagel Horton & Co., Inc., Argosy, Stockholm, 1,250 bls. sulphite, 254 tons.
E. J. Keller Co., Inc., Keifuku Maru, ——, 500 bls. wood pulp.

WOOD PULP BOARDS

Lagerloef Trading Co., Ragnhildsholm, Gothenburg, 65 rolls, 307 bls.

WOOD FLOUR

The Burnet Co., Gripsholm, Gothenburg, 630 bags.

(*Continued on page 92*)

WOOD PULPS

All Grades

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CANADA CEMENT BUILDING
MONTREAL, P. Q.

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SUPER ALPHA

for strength in Tear, Fold and Mullen. Super Alpha equals the higher grades of rags in the manufacture of fine papers.

EASY-BEATING ALPHA

This is a grade developed for mills of limited beating capacity. While not giving results equal to Super Alpha, it produces wonderful paper on short beating.

REGULAR ALPHA

This is a grade midway between Super and Easy-Beating.

Use ALPHA for Quality

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A HIGH GRADE LUBRICANT

At almost any price is better than the increasing wear and tear on valuable equipment caused by using inferior grade greases and compounds.

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are noted for their heat and water resistance as well as their lubrication efficiency.

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Successors to
H. C. Clark & Son Machine Co.

PAPER MILL MACHINERY

LEE, MASS.

Revolving Paper Cutters—Rag Cutters—Cylinder Paper Machines—Washing and Beating Engines—Chilled Iron and Paper Calenders—Fan and Stuff Pumps—Engine Roll Bars and Bed Plates—
Cylinder Molds—Marshall Drives—Slitters and Rewinders—Reels—Dryers with Improved Packing Boxes—Wet Machines—Gun Metal and Rubber Rolls—Rolls Reground.

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There's a Tycos or Taylor Instrument for Every Purpose — Tycos Building, Toronto, Canada

AV

Imports of Paper and Paper Stock

(*Continued from page 90*)

PHILADELPHIA IMPORTS

WEEK ENDING MAY 18, 1929

The Borregaard Co., Inc., Sulanierco, Hurum, 600 bls. sulphate, 100 tons.
J. Andersen & Co., Sulanierco, Gothenburg, 500 bls. sulphite, 101 tons.
D. L. Ward Co., Sulanierco, Gothenburg, 66 rolls paper.
Philadelphia National Bank, London Exchange, London, 347 bls. rags.
Pan American Wallpaper & Paint Co., London Exchange, London, 3 bls. wall paper.
Chase National Bank, Exchester, Algiers, 46 bls. rags.
E. J. Keller Co., Inc., Yone Maru, ——, 93 bls. rags.
E. J. Keller Co., Inc., Havre Maru, ——, 400 bls. rags.
Castle & Overton, Inc., Austvard, Spain, 279 bls. rags.
Castle & Overton, Inc., Hagen, Germany, 2,235 bls. wood pulp.
Castle & Overton, Inc., Yone Maru, Belgium, 59 bls. rags.
Castle & Overton, Inc., S. von Utrecht, Sweden, 300 bls. wood pulp.
Castle & Overton, Inc., Wytheville, Holland, 190 bls. wood pulp; 154 bls. rags.
Castle & Overton, Inc., Exminster, Spain, 152 bls. rags.
Castle & Overton, Inc., Ontario, France, 410 bls. rags.

BALTIMORE IMPORTS

WEEK ENDING MAY 18, 1929

The Borregaard Co., Sulanierco, Hurum, 600 bls. sulphate, 100 tons.
The Borregaard Co., Sulanierco, Gothenburg, 1,250 bls. wood pulp, 253 tons.
Katzenstein & Keene, Inc., Tomalva, Antwerp, 304 bls. rags.
Congoleum Nairn Co., Tomalva, Antwerp, 962 bls. rags; 221 bls. bagging.
Castle & Overton, Inc., Tomalva, Rotterdam, 170 bls. wood pulp.
Lagerloef Trading Co., Argosy, Hango, 306 bls. wood pulp, 51 tons.
Pagel Horton & Co., Inc., Argosy, Stockholm, 11,405 bls. sulphite.
Equitable Trust Co., Argosy, Stockholm, 750 bls. sulphate, 152 tons.
Castle & Overton, Inc., Harburg, Germany, 4,349 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING MAY 18, 1929

J. J. Shore Co., Tomalva, Antwerp, 109 cs. surface coated paper.
British American Tobacco Co., Tomalva, Antwerp, 36 cs. printed cigarette wrappers.
Darmstadt Scott & Courtney, Tomalva, Antwerp, 39 bls. rags; 109 bls. baggings.
N. Y. Trust Co., Tomalva, Rotterdam, 168 bls. bagging.
Lagerloef Trading Co., Argosy, Hango, 260 rolls wood pulp boards, 52 tons; 918 bls. wood pulp, 153 tons.
Virginian Paper Co., Argosy, Hango, 65 rolls, 236 bls. news print.
Old Dominion Paper Co., Argosy, Hango, 60 rolls news print.
Virginian & Pilot Publishing Co., Argosy, Hango, 264 rolls news print.
H. Reeve Angel & Co., Inc., Argosy, Hango, 53 rolls news print.
Pagel Horton & Co., Inc., Argosy, Stockholm, 1,295 bls. sulphite.

NEWPORT NEWS IMPORTS

WEEK ENDING MAY 18, 1929

Castle & Overton, Inc., Tomalva, Rotterdam, 679 bls. wood pulp, 108 tons.

PORTLAND IMPORTS

WEEK ENDING MAY 18, 1929

The Borregaard Co., Inc., Sulanierco, Hurum, 1,500 bls. sulphate, 254 tons.
The Borregaard Co., Inc., Sulanierco, Gothenburg, 1,000 bls. wood pulp, 203 tons.
Waterfalls Paper Mills, Sulanierco, Gothenburg, 1,980 bls. wood pulp, 401 tons.

BOSTON IMPORTS

WEEK ENDING MAY 18, 1929

The Borregaard Co., Inc., Sulanierco, Hurum, 300 bls. sulphate, 50 tons.
The Borregaard Co., Inc., Sulanierco, Gothenburg, 1,750 bls. wood pulp, 355 tons.
J. Andersen & Co., Sulanierco, Gothenburg, 1,250 bls. sulphite, 265 tons.
Irving Trust Co., Ragnhildsholm, Helsingfors, 300 bls. wood pulp.
——, Ragnhildsholm, Helsingfors, 1,532 bls. sulphite.
Scandinavian Pulp Agency, Inc., Ragnhildsholm, Norrkoeping, 6,250 bls. sulphate.
J. Andersen & Co., Ragnhildsholm, Gothenburg, 126 bls. sulphite.
A. Johnson & Co., Ragnhildsholm, Gothenburg, 14 rolls news print.
Perkins Goodwin & Co., Ragnhildsholm, Gothenburg, 254 bls. sulphite.
Beech Nut Packing Co., Ragnhildsholm, Gothenburg, 210 rolls wrapping paper.
Kidder Peabody Accep. Corp., Ragnhildsholm, Gothenburg, 1,343 bls. sulphite.
——, Ragnhildsholm, Gothenburg, 4054 lbs. Kraft pulp.
Price & Pierce, Ltd., Ragnhildsholm, Gothenburg, 500 bls. wood pulp.
Oxford University Press, Scythia, Liverpool, 5 cs. printing paper.
Castle & Overton, Inc., Wytheville, Holland, 1,764 bls. wood pulp.

Liva E. Barnes Dies at Sea

PITTSBURGH, Pa., May 20, 1929.—Liva E. Barnes, Pittsburgh paper wholesaler, died suddenly at sea near Maccassar in the East Indies, his associates were notified last week in a cablegram.

Mr. Barnes, touring the world with his only daughter and a photographer, suddenly suffered a heart stroke. He was buried at sea.

A member of Huff, Barnes & Opie, wholesale paper dealers, Mr. Barnes was prominent in business here since he helped organize the firm 24 years ago. He lived at 5825 Marlborough street.

Each winter he set out on long ocean voyages. With his daughter, Mrs. R. C. Plumer, of South Orange, N. J., and a photographer, Edward Foss, of Pittsburgh, Mr. Barnes sailed on January 10 for a trip around the world. For the last few years it had been his habit to take motion pictures of his trips and later exhibit them to friends in Pittsburgh.

Mr. Barnes was a member of the Duquesne Club, Keystone Club, Pittsburgh Athletic Association, the Masonic order and the Country Club. His wife, Anna Whitham Barnes, died six years ago. He leaves a daughter, a sister, Mrs. James Martin, of Connecticut, and a brother, Tim R. Barnes, of New Haven, Conn.

Mr. Barnes, a native of Connecticut, came to Pittsburgh 25 years ago as a paper salesman. A year later he was one of those who organized the firm of Huff, Barnes & Opie, whose headquarters now are in the Terminal Warehouse, South Side.

To Continue Binders Board Simplification

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 22, 1929.—The Simplified Practice Division, Department of Commerce, has announced that Recommendation No. 81, dealing with binders board has been reaffirmed, without change, for another year, by the standing committee of the industry.

N. S. Greensfelder Discusses Sales Problems

Nelson S. Greensfelder, advertising manager of the Hercules Powder Company, was one of the principal speakers at the conference on advertising and selling, held in Washington, D. C., on May 10, under the auspices of the National Industrial Advertisers Association, of which Mr. Greensfelder is president; the Industrial Committee of the Association of National Advertisers, Inc.; and the Associated Business Papers, Inc., in conjunction with the United States Department of Commerce.

The Hon. Robert P. Lamont, Secretary of Commerce, made the opening address, followed by Mr. Greensfelder, who stressed the importance of a census of industrial distribution in this country, which would bring to the surface "information of the greatest economic importance and would largely help to eliminate waste in the distribution of industrial products for which American buyers are now paying $35,000,000,000 a year." He also discussed the distinction between industrial and consumer selling; the position of industrial advertising in the field of industrial selling; domestic and foreign industrial selling, and the opportunity to do a better job at both.

To Make Pumps for Pump Mills

PORTLAND, Ore., May 17, 1929.—The Bingham Pump Company, Portland, has started production of a specially designed pump for pulp mills. One of these pumps has recently been shipped to Porto Rico. A shop force of twenty-five men is employed in this work.

To Represent Detroit Sulphite Pulp Co. on Coast

DETROIT, Mich., May 21, 1929.—The Detroit Pulp and Paper Company has appointed R. C. Bishop its sales representative for the Pacific coast. Mr. Bishop will have his offices at 203 Sheldon Building, San Francisco, Cal.

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Daily Capacity
525 TONS

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Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

Our SPECIAL PAPER brand for beater-sizing increases strength of sheet and gives improved finish.

Our FOX HEAD brand for top-sizing is more economical than all glue-size.

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FOURDRINIER WIRES

In brass, bronze and phosphor bronze, widths up to and including 250 inches.

Also
CYLINDER FACES
WASHER WIRES
and CORDUROY CLOTH

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Cleveland, Ohio, U. S. A.

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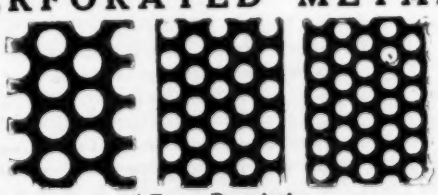

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, May 22, 1929.

Trading in the local paper market was moderately active during the past week. Demand for the various grades was mostly along routine lines. Prices are being maintained at formerly quoted levels, in most instances. Sales forces of the leading paper houses are still conducting a strenuous campaign for orders and anticipate a good volume of business before the warm weather arrives.

News print production in the United States and Canada is running at approximately 85 per cent of capacity and shipments are well up to average, according to statistics gathered by the News Print Service Bureau. Demand is persistent and the industry is in a better position than for some months past now that prices have been stabilized.

Conditions in the paper board market are practically unchanged. Production is being maintained in slightly larger volume but orders have not increased to any extent. Prices are fairly steady. Demand for the various grades of fine paper is satisfactory and prices are holding to schedule. Tissue mills are booked two weeks ahead. The coarse paper market continues rather spotty.

Mechanical Pulp

No radical changes were recorded in the ground wood market. Contract shipments of the various grades continue to move in satisfactory volume. Production is being maintained in sufficient volume to take care of current requirements, although accumulations are not excessive. Prices are holding to previously recorded levels.

Chemical Pulp

Due to delayed open water shipments the chemical pulp market was much firmer during the past week. Imported No. 1 strong unbleached sulphite was quoted at from $2.65 to $3.00. Imported Mitscherlich unbleached was offered at from $2.70 to $3.25. Domestic easy bleaching sulphite is now selling at from $2.65 to $3.00 and news sulphite at from $2.50 to $2.70.

Old Rope and Bagging

The old rope market continues to exhibit a strong undertone. Both domestic and imported old manila rope is in heavy demand, with offerings decidedly limited. Mixed strings are moving in fair volume. Little change transpired in the bagging market. Gunny bagging was in moderate request and scrap bagging failed to arouse much interest. Prices remain unchanged, in most instances.

Rags

Paper mill interest in the domestic rag market is well sustained. Demand for new cotton cuttings is persistent. Prices are holding up to previously quoted levels and there is not much talk of concessions around. Some improvement was also noticed in the foreign rag market. Roofing grades, in particular, are in better request, and prices rule fairly steady.

Waste Paper

The lower grades of paper stock are arousing more interest than of late from the paper board mills. Mixed paper and the various grades of news are also more active, while there is a better inquiry for old kraft machine compressed bales. Book and ledger stock remain steady. Soft white shavings are also displaying a firm trend.

Twine

Demand for the various grades of twine is mostly seasonal and the market is practically unchanged. Supplies are moving into consumption in normal volume for the time of year. While there is keen competition for exceptionally large orders, prices are generally holding to schedule and shading is infrequent.

Boston Paper Market More Active

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 20, 1929.—The market for both fine and kraft paper is improving, according to reports in the trade. The last week has been generally steady, with a good demand. With some houses the first four months of the year have shown a very satisfactory volume of sales.

Prices in box board are firm, although the situation is not all that could be desired. An advancing tendency continues, a Boston concern has received word from two mills that their price on chip board is $37.50. It is stated that if a substantial amount were sold at this figure the profit would be satisfactory. The general range now is $35 to $37.50 for chip and $37.50 to $40 for news board.

Old papers are steady, with prices unquotedly changed. The situation in manila rope is rather firm. New cuttings in rags are strong, with a satisfactory call. Roofing rags are likewise firm, with a good volume of orders being placed.

Pass Resolution on News Print from Cornstalks

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 22, 1929.—The Senate has passed, without discussion, the resolution offered by Senator Heflin, of Alabama, calling upon the Secretary of Agriculture for certain information in connection with the manufacture of news print from cornstalks, etc. The resolution as passed was as follows:

"WHEREAS, the conservation of our forests can be helped by the utilization of certain waste products of the farm; and

"WHEREAS, the Department of Agriculture has by its own experiments made print paper from cotton stalks and cornstalks; therefore be it

"RESOLVED, that the Secretary of Agriculture is hereby requested to send to the Senate such information as he possesses regarding the making of print paper from cotton stalks, cornstalks, and from other material."

Pacific Straw Paper Co. Buys Land

[FROM OUR REGULAR CORRESPONDENT]

LONGVIEW, Wash., May 18, 1929.—The Pacific Straw Paper and Board Company has purchased four additional acres of industrial property, giving it a total of 13 acres on the Cowlitz waterfront. This purchase is in line with its expansion policy over the period of the past four years since it started. Just at present it is doubling the capacity of its machine room and the adding of considerable machinery and employees. A new cylinder board machine of 92-inch width has just been ordered and it is expected will be in operation late this year. A new building 50 by 280 feet is being completed for the machine room.

Charles F. Schaub is president of the company and George B. Sweet is secretary-treasurer.

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Engineering Service for Paper Mills
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PAPER: Microscopical, physical and chemical tests. Complete laboratories. Constant standard conditions.
WOODPULP: Sampling, weighing, and moisture determinations by own staff at New York and Philadelphia Special arrangements for other ports.
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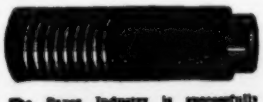
WYCKOFF WOOD PIPE
The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained.
Pressure Pipe That Never Bursts.
Built in sizes 1 inch to 48 inches.
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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, May 22, 1929.

BLANC FIXE.—Trading in the blanc fixe market was moderately active during the past week. Contract shipments were normal. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, while the powder is selling at from 3¼ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is practically unchanged. Supplies are moving into consumption in fairly satisfactory volume. Prices are generally holding to previously recorded levels. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in large drums, at works.

CASEIN.—Steadiness prevails in the casein market. Domestic casein is quoted at from 16 cents to 17 cents per pound, while standard ground imported is selling at from 15½ cents to 16 cents per pound and finely ground at from 16½ cents to 17 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—The caustic soda market is exhibiting a strong undertone. Contract shipments are well up to average and prices are unchanged. Solid caustic soda is quoted at from $2.90 to $2.95, while the flake and the ground are selling at from $3.30 to $3.35 per 100 pounds, in large drums, at works.

CHINA CLAY.—Most of the business transacted in the china clay market was along routine lines. Shipments against contract are moving at a steady pace. Imported china clay is quoted at from $15 to $25 per ton, ship side, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—The chlorine market is in a sound position. Demand for this product is normal and prices are unchanged. Chlorine is quoted at 3 cents per pound, in tanks, or multi-unit cars, at works, on standard contracts. The spot quotation ranges from 3¼ cents to 3½ cents per pound.

ROSIN.—Little change was reported in the rosin market. At the naval stores, the grades of gum rosin used in the paper mills are quoted at from $8.35 to $8.45 per 280 pounds, in barrels, ex dock. Wood rosin is selling at from $6.50 to $7.30 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—The salt cake market is displaying a steady trend. The contract movement is well up to average. Prices are generally holding to schedule without difficulty. Salt cake is quoted at from $16 to $18 per ton, while chrome salt cake is selling at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—Production of soda ash is being maintained in sufficient volume to take care of current requirements. Prices are holding to previously quoted levels. Contract quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bags, $1.32½; and in barrels, $1.55.

STARCH.—Conditions in the starch market are fairly satisfactory. Demand is about normal for the time of year. Shipments are going forward at a steady pace. Prices are unchanged. Special paper making starch is quoted at $3.82 per 100 pounds, in bags, and at $3.99, in barrels.

SULPHATE OF ALUMINA.—Demand for sulphate of alumina is persistent. Supplies are moving into consumption in good volume. Prices are steady and unaltered. Commercial grades of sulphate of alumina are quoted at from $1.40 to $1.55 and iron free at from $1.95 to $2.05 per 100 pounds, in bags, at works.

SULPHUR.—No radical changes were reported in the sulphur market. Prices are unchanged. Sulphur is quoted at $18 per ton, in lots of 1,000 tons, on yearly contracts, and at $20 per ton for any smaller quantity over that period. On spot and nearby car loads, the quotation is $21 per ton.

TALC.—The talc market was fairly active during the week. Shipments against contract are moving in routine volume. Prices are holding to schedule. Domestic talc is still quoted at from $16 to $18 per ton, at eastern mines, while imported talc is selling at from $18 to $20 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@45.00
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	8.00	@11.00
Book, Cased—		
S. & S. C.	6.00	@ 7.50
M. F.	5.75	@ 7.00
Coated and Enamel	7.50	@12.00
Lithograph	7.50	@12.00
Tissues—Per Ream—		
White No. 1	.75	@ 1.00
Anti-Tarnish	1.35	@ 1.90
Colored	1.00	@ 2.00
White No. 2	.75	@ .80
Kraft	1.00	@ 1.10
Manila	.75	@ .80
Kraft—		
No. 1 Domestic	6.25	@ 6.50
No. 2 Domestic	5.25	@ 5.50
Southern	4.25	@ 4.50
Imported	6.50	@ 7.00
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.75	@ 5.25
No. 2 Wood	4.00	@ 4.50
Butchers	3.75	@ 4.25
Fibre Papers—		
No. 1 Fibre	5.00	@ 5.50
No. 2 Fibre	4.75	@ 5.25
Common Bogus	2.75	@ 3.00
Screenings	3.00	@ 3.25
Card Middles	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

(Delivered New York)

News, per ton—		
Rolls, contract	62.00	@ —
Rolls, spot	62.00	@ —
Sheets	67.00	@ —
Side Runs	47.00	@52.00
Boards—per ton—		
News	37.50	@ —
Straw	52.50	@55.00
Chip	35.00	@ —
Binders' Boards	65.00	@70.00
Sgl. Mla. Ll. Chip	47.50	@ —
Wood Pulp	80.00	@85.00
65 Test Jute Liner	52.50	@ —
85 Test Jute Liner	55.00	@ —

Mechanical Pulp

(Ex-Dock)

No. 1 Imported—		
Moist	30.00	@33.00
Dry	32.00	@34.00

(F. o. b. Mill)

No. 1 Domestic	26.00	@30.00
Screenings	15.00	@20.00

Chemical Pulp

(Ex-Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.75	@ 4.40
Easy Bleaching	2.90	@ 3.10
No. 1 strong unbleached	2.65	@ 3.00
Mitscherlich unbleached	2.70	@ 3.25
No. 2 strong unbleached	2.40	@ 2.50
No. 1 Kraft	2.40	@ 2.75
No. 2 Kraft	2.35	@ 2.50
Sulphate—		
Bleached	3.60	@ 3.85

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	3.40	@ 4.75
Easy Bleaching Sulphite	2.65	@ 3.00
News Sulphite	2.50	@ 2.70
Mitscherlich	3.00	@ 3.25
Kraft (Domestic)	2.50	@ 3.30
Soda Bleached	3.25	@ 3.40
Sulphate Screenings—		
Coarse	.75	@ .95
Refined	1.65	@ 1.85

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	11.00	@11.50
New White, No. 2	8.00	@ 8.50
Silesias No. 1	7.50	@ 8.00
New Unbleached	11.00	@11.50
New Blue Prints	5.25	@ 5.50
New Soft Blacks	5.25	@ 5.75
Strictly Folded	.58	@ .63
No. 1 Mixed Paper	.45	@ .50
Washables	4.75	@ 5.25
Fancy	5.75	@ 6.25
Mixed Khaki Cuttings	4.75	@ 5.25
Pink Corset Cuttings	8.00	@ 8.50
O. D. Khaki Cuttings	5.15	@ 5.75
Men's Corduroy	3.75	@ 4.25
New Mixed Blacks	3.50	@ 3.75

Old Rags

White, No. 1—		
Repacked	5.50	@ 6.00
Miscellaneous	4.50	@ 5.00
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.50	@ 2.75
St. Soiled, White	2.00	@ 2.15
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.75	@ 2.00
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.70	@ 1.80
No. 1	1.70	@ 1.80
No. 2	1.55	@ 1.65
No. 3	1.30	@ 1.40
No. 4	1.25	@ 1.35
No. 5A	.90	@ 1.05

Foreign Rags

New Rags

New Dark Cuttings	2.50	@ 3.00
New Mixed Cuttings	2.75	@ 3.25
New Light Silesias	7.00	@ 7.50
Light Flannelettes	7.50	@ 8.00
Unbleached Cuttings	10.00	@11.00
New White Cuttings	10.50	@11.50
New Light Oxfords	7.00	@ 7.50
New Light Prints	5.50	@ 6.50

Old Rags

No. 1 White Linens	7.50	@ 8.25
No. 2 White Linens	5.75	@ 6.75
No. 3 White Linens	4.75	@ 5.25
No. 4 White Linens	3.00	@ 3.50
No. 1 White Cotton	5.50	@ 6.50
No. 2 White Cotton	4.50	@ 5.50
No. 3 White Cotton	3.00	@ 4.00
No. 4 White Cotton	1.90	@ 2.15
Extra Light Prints	2.75	@ 3.25
Ord. Light Prints	2.25	@ 2.50
Med Light Prints	1.90	@ 2.10
Dutch Blue Cottons	2.20	@ 2.40
French Blue Linens	2.75	@ 2.85
German Blue Linens	2.35	@ 2.55
German Blue Cottons	2.15	@ 2.25
Checks and Blues	1.85	@ 2.00
Lindsay Garments	1.90	@ 2.00
Dark Cottons	1.60	@ 1.65
Old Shopperies	1.55	@ 1.60
New Shopperies	1.50	@ 1.60
French Blues	2.10	@ 2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.65	@ 1.75
Domestic	1.70	@ 1.75
Wool Tares, light	1.60	@ 1.65
Wool Tares, Heavy	1.65	@ 1.75
Bright Bagging	1.65	@ 1.70
Small Mixed Rope	1.25	@ 1.40
Manila Rope—		
Foreign	4.40	@ 4.65
Domestic	4.75	@ 5.00
New Burlap Cut	2.75	@ 3.00
Hessian Jute Threads—		
Foreign	3.50	@ 4.00
Domestic	3.25	@ 3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	3.25	@ 3.50
Hard, white, No. 2	2.40	@ 2.55
Soft, White, No. 1	2.50	@ 2.60
White envelope cuttings	3.00	@ 3.50
Flat Stock—		
Stitchless	1.60	@ 1.70
Overissue Mag	1.60	@ 1.70
Solid Flat Book	1.50	@ 1.60
Crumpled No. 1	1.10	@ 1.20
Solid Book Ledger	2.00	@ 2.10
Ledger Stock	1.70	@ 1.80
New B. B. Chips	.65	@ .75
Manilas—		
New Env. Cut	2.40	@ 2.60
New Cuttings	1.60	@ 1.85
Extra No. 1 old	1.25	@ 1.35
Print	.75	@ .80
Container	.58	@ .63
Bogus Wrapper	.75	@ .85
Old Kraft Machine Compressed bales	1.80	@ 1.90
News—		
No. 1 White News	1.65	@ 1.75
Blue Overall	7.50	@ 8.00
Strictly Overissue	.75	@ .80
Strictly Folded	.55	@ .60
No. 1 Mixed Paper	.43	@ .48
Common Paper	.30	@ .35

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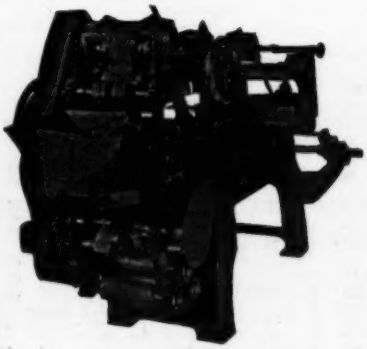

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Twines
(F. o. b. Mill)

Cotton—			
No. 1	.39	@	.40
No. 2	.37	@	.38
No. 3	.36	@	.37
B. C., 18 basis	.38	@	.40
A. B. Italian, 18 basis	.48	@	.53
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrapping, 3-6 Ply—			
No. 1	.19	@	.21
No. 2	.18	@	.20
Tube Rope—			
4-ply and larger	.16	@	.17
Fine Tube Yarn—			
5-ply and larger	.21	@	.25
4-ply	.25	@	.29
3-ply	.28	@	.32
Unfinished India—			
Basis	.13	@	.14
Paper Makers Twine			
Balls	.11	@	.12
Box Twine, 2-3 ply	.15	@	.17
Jute Rope	.17	@	.19
Amer. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.16	@	.18
No. 2 Basis	.14	@	.16
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Rope	.22	@	.24

CHICAGO

Paper
(F. o. b. Mill)

All Rag Bond	.35	@	.41
No. 1 Rag Bond	.25	@	.34
No. 2 Rag Bond	.14	@	.25
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine writing	.18	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	.06¼	@	.06½
Southern Kraft	.03¾	@	.04
No. 2 Kraft	.04	@	.04¼
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue—			
24x36 Sheet	.07	@	.07¾
White Tissue—			
20x30 Sheet	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	62.00	@	—
Sheets	67.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	42.50
Solid News	47.50	@	—
Solid News	40.00	@	45.00
Manila Lined Chip	50.00	@	55.00
Container Lined—			
85 Test	65.00	@	70.00
100 Test	70.00	@	—

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.20	@	2.25
White Env. Cuttings	2.40	@	2.50
No. 1 Soft Shavings	2.00	@	2.10
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.70	@	.75
Ledger & Writings	1.25	@	1.35
Solid Books	1.25	@	1.30
Blanks	1.40	@	1.50
Krafts	1.60	@	1.75
New Kraft Cuts	2.15	@	2.25
Manila Envelope Cuttings	1.65	@	1.75
Ex. No. 1 Manila	1.30	@	1.45
Print Manila	.75	@	.80
Folded News (overissue)	.80	@	.85
Old Newspapers—			
No. 1	.65	@	.70
No. 2	.60	@	.65
Mixed Papers—			
No. 1	.60	@	.65
Roofing Stocks—			
(F. o. b. Chicago, net cash)			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.06	@	.40
Ledgers	.09	@	.40
Writings—			
Superfine	.12½	@	.18
Extra fine	.18	@	.22
Fine	.17	@	.26
Fine, No. 2	.15	@	.25
Fine, No. 3	.10	@	.20
Book, M. F.	.05½	@	.07
Book, S. S. & C.	.06	@	.07½
Book, Coated	.09½	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.08	@	.09
Manila Sul., No. 1	.04	@	.05½
Manila No. 2	.03	@	.04
No. 2 Kraft	.06	@	.06½
No. 1 Kraft	.06½	@	.07
Common Bogus	.03½	@	.04
(Delivered Philadelphia)			
News Print Rolls	62.00	@	—
Straw Board	52.50	@	75.00
News Board	35.00	@	40.00
Chip Board	32.00	@	40.00
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00		
No. 2, per ton	70.00		
Carload lots	68.00	@	70.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.10½	@	.11
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.07	@	.09
Black Silesia, soft	.05	@	.05½
New Unbleached	.10½	@	.11
Washable, No. 1	.04½	@	.05
Blue Overall	.07½	@	.08
Cottons—According to grader—			
Washable, No. 2	.03	@	—
New Blue	.03	@	.03¼
Fancy	.05½	@	.06
New Black Soft	.05	@	.05¼
New Light Seconds	.02½	@	.03
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05½	@	.05¾
No. 2 Mixed	.04½	@	.04¾
Corduroy	.03	@	.03¼
New Canvas	.08½	@	.09
New Black Mixed	.03¾	@	.04½

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	3.50	@	4.00
Sisal Rope	1.50	@	—
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	3.20	@	3.25
No. 2 Hard White	2.75	@	3.00
No. 1 Soft White	2.50	@	2.60
No. 2 Soft White	1.90	@	2.00
No. 1 Mixed	1.50	@	1.60
No. 2 Mixed	.90	@	1.00
Solid Ledger Stock	1.85	@	1.90
Writing Paper	1.60	@	1.65
No. 1 Books, heavy	1.35	@	1.40
No. 2 Books, light	1.05	@	1.15
No. 1 New Manila	2.40	@	2.50
No. 1 Old Manila	1.50	@	1.60
Print Manila	.95	@	1.00
Container Manila	.85	@	.90
Old Kraft	2.25	@	2.50
Common paper	.50	@	.55
No. 1 Mixed Paper	.65	@	.70
Straw Board, Chip	.65	@	.70
Binders Board, Chip	.65	@	.70
Overissue News	.85	@	.90
Old Newspaper	.50	@	.55

Domestic Rags (Old)

White, No. 1—			
Repacked	4.25	@	4.50
Miscellaneous	3.50	@	3.75
White, No. 2	2.00	@	2.25
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.60	@	1.80
Black Stockings (Export)	3.90	@	4.25
Roofing Stock—			
Foreign No. 1	1.65	@	1.75
Repacked	.02½	@	.02¾
No. 2	1.30	@	1.35
No. 3 (Roofing)	1.15	@	1.25
No. 4	1.00	@	1.15
No. 5A	.75	@	.85
B	.65	@	.75
C	.65	@	.75

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.15
Rag content	.15	@	.30
All rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.07	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05¾	@	.08¾
Book, Coated	.08¾	@	.20
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.06¼	@	.06½
No. 2 Kraft	.04½	@	.05½
Common Bogus	.02	@	.02¾
Delivered New England points			
News Print Rolls	61.50	@	—
Straw Boards, rolls .009			52.50
Straw Board in Sheets, basis 35s to 70s	54.50	@	55.00
Filled News Board	37.50	@	40.00
Chip Board	35.00	@	37.50
Single Manila Lined Chip	47.50	@	50.00
Single White, Patent Coated Newsboard Bender	65.00	@	80.00
Wood Pulp Board	80.00	@	85.00
Binder Boards	70.00	@	75.00
(F. o. b. Mill)			
Tarred Felts—			
Regular, carload lots	65.00	@	—

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	2.40	@	2.50
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	2.35	@	2.45
No. 1 Books, Heavy	1.50	@	1.55
No. 1 Books, Light	—	@	1.15
Manila Env. Cuttings	2.00	@	2.25
No. 1 Old Manila	1.05	@	1.10
White Blank News	1.60	@	1.65
Old Kraft	—	@	1.80
Print Manila	.80	@	.90
No. 1 Mixed Paper	.47½	@	.50
Overissue News	.65	@	.80
Old Newspapers	.50	@	.52½
Box Board, Chip	.55	@	.60

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.75
Manila Rope—			
Foreign	4.50	@	4.75
Domestic	5.00	@	—
Mixed Strings	.90	@	1.00
Jute Wool Strings	—	@	1.00
Scrap Burlaps	1.25	@	1.35
Scrap Sisal	1.60	@	1.80
Scrap Sisal for shredding	—	@	1.65
Wool Tares, heavy	—	@	1.37½
New Burlap Cutting	1.90	@	2.00
Australian Wool Pouches	2.75	@	3.00

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.09½	@	.10
Silesias, No. 1	.06	@	.06¼
New Unbleached	.10	@	.10¼
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06¼	@	.06¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.04	@	.04¾
O. D. Khaki	.05	@	—
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.75	@	3.00
Thirds and Blues—			
Repacked	2.50	@	—
Miscellaneous	1.75	@	1.90
Black Stockings	—	@	4.00
Roofing Stock—			
No. 1	1.65	@	1.75
No. 2	1.45	@	1.55
No. 3	1.05	@	1.10
No. 4	1.10	@	1.15

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.60	@	1.65
New No. 1 Shirt Cuttings	9.00	@	10.00
Dutch Blues	2.00	@	2.12½
Lace Curtains	5.10	@	5.50
New Checks & Blues	4.25	@	4.50
Old Fustians	1.90	@	—
Old Linsey Garments	1.85	@	1.90

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¾	@	—
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	7.50	@	—
No. 2 M. F. (carloads)	7.25	@	—
No. 3 M. F. (carloads)	7.00	@	—
No. 1 S. C. (carloads)	8.00	@	—
No. 2 S. C. (carloads)	7.75	@	—
No. 3 S. C. (carloads)	7.50	@	—
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	11.50	@	—
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.80	@	—
No. 1 Manila	6.65	@	—
Fiber	6.65	@	—
Kraft, M. F.	7.00	@	—
M. G.	7.00	@	—
(Delivered Toronto)			
News, per ton—			
Rolls (contract)	61.50	@	62.00
Sheets	67.00	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	31.00
Sulphite easy bleaching	60.00	@	—
Sulphite news grade	60.00	@	—
Sulphite, bleached	77.00	@	—
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.00	@	—
Soft White Book Shavings	2.85	@	—
White Blk. News	1.60	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.40	@	—
Light and Crumpled Book Stock	1.25	@	—
Ledgers and Writings	1.50	@	—
Solid Ledgers	1.50	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.85	@	—
Strictly Folded	.85	@	—
No. 1 Mixed Paper	.65	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.10	@	.10¼
Fancy Shirt Cuttings	.05½	@	—

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M&W ROTARY SCREEN

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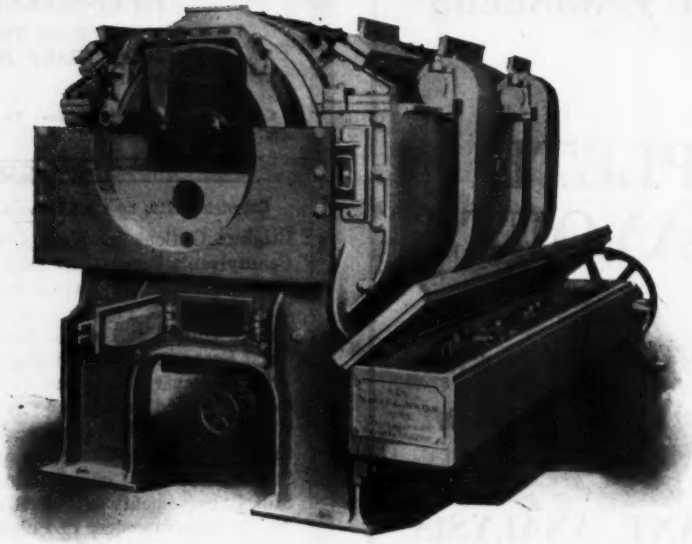

— QUICK — WASHUP

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